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I.—OTHER MINDS (III.).

BY JOHN WISDOM.

White. But to me this conclusion, that one can never really know what is going on in the minds of others, is as objectionable as denying the premises which brought us to it. Indeed, I would rather say that "Smith will be blind in a few days" means more to him than it does to us, I would rather deny that it means the same to us as it does to him, than say that we can never know that he's blind or know that he sees. If I were to say "We never know what is going on in the minds of others" I shouldn't be able to face the gibes of Professor G. E. Moore—"What, so you don't know that I'm thinking about philosophy now as we sit here talking?" And I shouldn't face these gibes because I feel inclined to make them myself, they are echoed by my own linguistic super-ego.

Black. If you were to say that "Smith will be blind in a few days" means no more than something about the behaviour of his body or to say that at any rate certain behaviour is all it leads us to expect you would come into conflict with Professor Moore again. For it just isn't true that that is all it leads us to expect, as we have noticed with some care.

White. True. And now it occurs to me to ask: Why shouldn't we stick entirely to the truth? Why shouldn't we say that "Bobby will feel sick" doesn't mean the same as "Bobby will sit silent, turn yellow and bring up his breakfast" *and* that nevertheless we sometimes know that Bobby feels sick? But no, an uneasiness remains. However often it is proved that

psychological statements about others don't mean the same as the bodily stories on which they are based, and however often it is proved that nevertheless we sometimes know psychological statements about others to be true, people constantly advance the paradoxical opposites of these. For the proofs of the proper statements suppress but don't remove the inclinations to make the improper statements. Indeed, can't we define a philosophical discussion as a discussion as to whether any of us know what all of us know we all know?

Black. No. For some philosophical discussions are about how we come to know what we all know, for example how we come to know that 3 + 1 makes 4. Indeed, the uneasiness about our knowledge even of matters of fact sometimes shows itself in this way. Once I said to Moore, that great apostle of propriety, "What bothers you about statements about the minds of others? You are satisfied that they don't mean the same as any stories, however complete, about their bodies; you are satisfied of course that sometimes you know such statements to be true. Is it then only the folly of others that bothers you? You yourself surely find nothing puzzling about the matter?" He replied that of course sometimes he knew statements about the minds of others to be correct, but that what bothered him was that he didn't know *how* he knew them to be correct.

White. You should have replied, using the Hume [1]-Moore technique, "Not know how you know statements about the minds of others! What, don't know how you know I'm thinking about philosophy? You pour scorn on philosophers who say we don't know things we all know we know. But you yourself are doing this with regard to our knowledge of the knowledge".

Black. Moore would have replied, "Of course I know that it's somehow from your expression and the things you say that I know you are thinking about philosophy. But I don't know how I get from my knowledge of your expression and what you say to my knowledge of what you are thinking about or even my knowledge that you are thinking".

White. You might then have replied, "You might as well say that you don't know how you get from knowledge of how things have happened in the past to knowledge of how they will happen in the future". There are, as you will remember, people who say this kind of thing. Indeed, there are people [2] who say

[1] Hume's remark is to the effect that while a philosophy keeps "wholly in generals" it may include any absurdity, but when brought to particular cases, . . . I cannot find the passage.

[2] Though we decided not to concern ourselves with them, MIND, October, 1940, p. 369.

this kind of thing in connexion with knowledge of mental events. Such people say, " To know a man's mental state involves at any rate knowing more than what he is doing at the moment, it involves knowing also what he would do if this or that were now to happen. Now we can know what a man has done and is doing, but (1) we can't know what he would do, or (2) if we do it's very obscure how we do unless (3) when we talk of what he would do this is only a way of describing the sequences we have already observed in his past behaviour, and what he is doing now ". This, in characteristic threefold form, is a case of the inductive metaphysical puzzles, and just as this difficulty is met by talk in accordance with the principle " Every sort of statement has its own sort of logic " so might we meet the difficulty " How from outward signs do we learn of inward states ? " But the point I wish to make at the moment is that the cry " Don't know how we know ", " Don't know how from Ys we know Xs " is an expression of the same uneasiness as finds expression in the desperate expedients of Scepticism, Phenomenalism and Intuitionism. When an animal finds it can't jump out of an enclosure nor break out and has not yet fallen into despondency, then it will stand alert but motionless.[1] But this too is an expression of its uneasiness.

Faced with someone who says " Our only basis for knowledge of Xs is our knowledge of Ys, but how do we make the step ? " the Sceptics reply " We don't " ; the Phenomenalists reply " There is no step " ; the Intuitionists reply " Knowledge of Ys is *not* our only basis for our knowledge of Xs, there is another mode of knowledge ". To say " None of these answers will do. There is a step, and we take it, but goodness knows how " is not an alternative answer, it is a repetition of the complaint.[2]

We want assurance of a father in heaven, of a world beyond the stars. But how to get it from our vast but ambiguous information about the habits of animals and the properties of materials ? Perhaps it can't be got. Or perhaps the fatherhood of God is the brotherhood of men. This is something more imaginable and ascertainable. But it isn't the same thing. And it hardly fills the bill. It provides for life maybe. But not for death. Was then the old assurance an illusion ? Since it cannot be

[1] This connects with Wittgenstein's man who strives to get out by the window, by the chimney, but doesn't notice the door behind him.

[2] This would be apparent if Phenomenalism, Scepticism and Intuitionism were always properly introduced as moves made after other moves. The value of a move cannot be judged without knowing what moves have been made and what are intended.

reduced to and cannot be inferred from what we learn by our five senses, must it be a myth like Charon and the Styx? Or is there another equally sure but less obvious mode of knowing which serves us here, the inner light, the knowledge that comes by faith, a knowledge where nature and beauty and kindness may play a part in providing a setting[1] in which this knowledge may come to us, though they do not provide premises from which it can be obtained as an inference?

It is no answer to reply to all this "It is very true that what has always been meant by the existence of God is something more than the brotherliness of men or the beauty of the world, and I don't see how we may pass by any known process of argument from such facts or any other facts of nature to the existence of God, and I can't find in myself any special mode of knowing that God exists. And yet somehow we know that he does". That states the dilemma, but it doesn't describe a way out.

Gray. But it suggests a way out of the difficulty about how we know the mental condition of others. The words 'process of argument' suggest an alternative which neither you nor Black have mentioned in connexion with the step from patterns of behaviour to the existence and nature of mental states. I agree with you, White, that we cannot say that we never know when someone is feeling sad or happy or sick, although, of course, it's easy to make mistakes about these things, and I agree with Black that what we know when we know someone is sad is not merely something about how he would answer if we spoke to him. I agree with what you have now both agreed to, namely, that when we expect a man to go colour blind then we don't expect only what we shall see. Like the man himself, we also expect him to see things differently in a way with which we are quite familiar from ourselves having seen things under a full moon and so on. And don't think I am going to say that our knowledge of other minds is gained by some special means, a sort of intuition or unconscious telepathy. The only sense in which I understand telepathy is that in which a man may guess from his own sensations (his images or what he finds his hand drawing) at what another man will report as his sensations. What I want to know is, why we shouldn't say what it seems to me we do say, namely, that how a man looks and what he does, though it doesn't constitute his state of mind, provides good evidence from which we may infer what his state of mind is.

[1] *Cf.* Broad, *Five Types of Ethical Theory*, p. 110: "Emotions . . . furnish the necessary occasions on which the intellect intuites certain ethical relations".

It is true that we cannot absolutely *prove* conclusions about a man's state of mind from premises about his behaviour, but such premisses may *render probable* conclusions about his state of mind, and in certain cases, in many cases, this probability is very high.

White. But such an account of our uneasiness at saying that we don't know what is going on in the minds of others fails to give us enough ; for what we say and can't comfortably give up saying is that we sometimes, indeed often, *know* what a man is thinking about and how he is feeling.

Gray. Precisely, we do use ' know ' thus loosely. Conclusions about a man's state of mind cannot be proved demonstratively from premises about his behaviour, but they can by such premises be rendered very probable, we may even say proved in a loose but colloquial sense. We do, in fact, so use ' know ' that we speak of knowing Q on the basis of our knowledge of P even when P merely renders very probable Q. And this is why we feel uncomfortable about saying that we don't know what is going on in the minds of others. For, of course, we often have knowledge which renders very probable conclusions about what is going on in the minds of others.

White. There are, it is true, cases in which we say " I know that Q because I know that P " where we should be prepared to substitute " I have the best of reasons for believing that Q because I know that P " or " It is practically certain that Q since P ". We say such things as " I know he's in because his hat's in the hall " when we should be prepared to say instead " I have the best of reasons for believing that he's in " or " It's practically certain that he's in " or " I've noticed something which makes it extremely probable that he's in ". But there are cases where we should not be prepared for this substitution. We should not be prepared to substitute for " I know there are two loaves left, I've just looked " " It's extremely probable there are two loaves left, I've just looked ".

Gray. I admit that the higher—the highest degrees of probability we do not usually express in terms of probability at all. The consequence is that to speak in terms of even a very, very high degree of probability suggests that the speaker has some doubt and would not offer more than 1000 to 1 against being wrong. And the consequence of this is that where the speaker feels not even such a doubt it is unconventional for him to speak of probability. But there is no difference in kind between those cases of very high probability which we speak of as knowledge and cases where we quote a price.

White. We do sometimes describe the higher degrees of probability as knowledge. But do we *seriously?* We say "I don't think it very, very probable that he'll win, I *know* he'll win". But then you must remember that at this others smile a little and say "Too many cast-iron certainties have come unstuck when the flags went down".

Gray. A scientist may say "I don't think it very, very probable that if you put some of that in there'll be an explosion, I know there will be"; a doctor may say "I don't think it very, very probable that if you give him a double dose of that he'll die, I know he will". Can you say they are not colloquially right to speak of knowing here? And yet, after all, what is a doctor but a high-class professional backer?

White. Yes, but I must insist that there's a big difference between the doctor and the housewife who knows that there are two loaves left in the larder, or the mother who knows her child is pleased.[1] When the doctor says "From the state of his heart I know that a double dose of that stuff would be fatal" or "From his general condition I know he can't live till morning" there is something we can do which we should call "making sure whether the doctor is right". For example, we might say to the doctor, "You never know till you try", and give the patient the double dose, and then, when he dies, say "*Now* I know that what you said was right". But there's no way of making sure whether our eyes are right. When we stand with the housewife before the loaves in the larder there is no more to be done which we should call really making sure whether there are two loaves left. We can, of course, feel with our hands and sniff with our noses, but that's only doing more of the same sort of thing as looking. When a man predicts an explosion or death, then from one thing he predicts another on the basis of experience—again and again such a condition of the heart has been followed by death. If someone questions the doctor's prediction of collapse, it is only necessary to wait to see whether the association between the heart's present condition and collapse is or is not maintained in the case in question.

And it is this which gives point to saying to the doctor "You don't know he'll collapse, its only that it's very probable on your information". The point of saying "It's not more than probable" and the justification for saying "It is probable" are as follows: The point of saying "It's only probable" is to con-

[1] I feel inclined to say I know there's a loaf before me better than any doctor knows how his patient will respond to this or that treatment, but that I can't as well see how I know nor see how I know as well.

trast the sort of knowledge which the doctor has with the superior knowledge of one who waits and sees the collapse. To take another example, one might say " You don't even know that the valves of his heart are leaking ", in order to contrast the doctor who believes they are leaking, on the basis of what he can hear, with the doctor who believes they were on the basis of what he can see at the post mortem.

The justification for saying that experience gives a high probability to the doctor's belief that the patient will collapse is the frequency with which a heart with leaking valves has led to collapse.

Now the statement " The housewife doesn't know, though it is probable on her data, that there's bread in the larder " differs in two respects from " The doctor doesn't know, though it's probable on his data, that the patient will collapse ". The former differs from the latter in that (1) it lacks the point in what it denies which the latter has, and in that (2) the probability it claims, if it exists, has a different sort of justification. It lacks the point in what it denies, for, as we have just reminded ourselves, there is no way of finding out whether there are two loaves in the larder superior to that of going and having a good look, there is no other process suitable for this purpose which it is proper to dignify with the name of " coming to know ", in opposition to the mere " concluding from the testimony of " our senses which happens in seeing.

And the statement lacks the justification it should have for what it asserts. For our experience has not proved our senses reliable witnesses like leaking valves. True, our senses mostly agree among themselves. But so they would if they were lying, if they had any sense, so that proves nothing. True, when they all agree we have never found them all wrong, indeed, one can't even imagine doing such a thing. But in the very same way one cannot even imagine finding them all right. *A fortiori* we have not, in fact, done so. We have not often found that when they all agree they are right, as we have mostly with human witnesses. And if we have never found a B associated with an A, not even with the most striking A's, then how can the presence of an A here and now, in the larder say, support by analogy the presence of a B ?

Gray. Like this : many diseases whose causal story, progress and disappearance follow a certain pattern have been found to be associated with germs in the blood stream in the sense that when a sample of the patient's blood has been taken and carefully examined under the microscope small creatures have been seen

swimming about in it. By "a certain pattern of causal story" I mean this sort of thing: These diseases are catching but less catching if the people who have them are careful, and still less catching if the people who haven't them are careful too and wear muslin masks and gargle every night and so on. And by "a certain pattern of progress and disappearance" I mean that the temperature of sufferers from these diseases rises and their other symptoms increase until a climax and then—and so on. Of course, the period of incubation and infection varies, but there is a likeness in the way these diseases come and the way they go, and what makes them worse and what makes them better. Colds and influenza and measles are diseases whose causal story, progress and disappearance is of this pattern. And surely it is on this account that it is reasonable to suppose that colds and influenza and measles are due to germs. And this, notice, is reasonable, although the most careful microscopic examination of persons suffering from these diseases fails to reveal any associated germs.[1] And surely it would remain reasonable, even though *every*one should give up *all* hope of ever making a microscope which would reveal them. And isn't this so because in analogous cases we have found germs?

White. But this is different. As you say, it is reasonable because in *analogous* cases we have found germs, that is to say, it is reasonable because though we have never found a measle germ associated with measle-symptoms we have in cases with like symptoms found, not indeed measle germs, but things of the same sort—we have in other cases found germs, though not measle germs. But we have not in other cases found things which though not physical objects are of the same sort. It is nonsense to talk of doing such a thing, because a thing of the same sort would be a physical object. Physical objects aren't a species of object in the way that measle germs, if they exist, are a species of germ. And another aspect of this is that even if people were to have no idea as to what would lead to the seeing of a measle germ and were to have no expectation of seeing one they nevertheless could explain what it would be like to see one. But not only does no-one expect to come on anything more once he has seen, smelt, touched and tasted a loaf, he also could not explain what it would be like to do so. It is, indeed, quite nonsense to talk about his "finding a loaf".

Gray. But you yourself have explained how invisible wolves are not a species of wolf like timber wolves are. And even

[1] In fact there is *a* visible influenza bacillus.

wolves which though visible were visible only after carrying out a certain procedure in magic would not be a species of wolf in the way that timber wolves are. For the grammar of 'magic wolf' is different from the grammar of 'curly wolf' and 'timber wolf'. And, of course, in the same way, the grammar of 'microscopic wolf' is different, since the microscope is only a kind of magic. And the grammar of 'sub-microscopic wolf' is different again from the grammar of 'microscopic wolf'. Indeed, the difference here is very marked indeed. For, as we have seen, a dispute as to whether there is a magic or a microscopic wolf in a wood where the wolfhounds give tongue though no wolf is to be seen by the naked eye is what you would call a betting issue. But the dispute as to whether there are sub-microscopic wolves when it is already agreed that the wolfhounds are giving tongue is no more a betting issue than is "There will come a day when there will be no more war". And so I want to say that no-one has ever observed a thing of the same sort as a sub-microscopic germ. And yet I must insist that our experience justifies by an argument by analogy our belief in the existence of sub-microscopic germs.

White. What this shows is not that we know by analogy of the existence of physical objects, but that we don't know by analogy of the existence of things which we have found to be invisible. It is true that analogy may put into our heads the idea that measles is due to a germ, that there is something the presence of which is responsible for the multitude of symptoms, and, further, this idea at first has a certain plausibility, probability, because of the analogy of the symptoms with other groups of symptoms which have been found to be due to something in the blood. But the idea which is probable is the idea that there is a *visible* thing; *that* is what analogy suggests. When we have looked and found there isn't any such thing, then that idea can no longer be said to be probable, but is on the contrary known to be false, the analogy is known to have broken down.

Gray. Yes, *that* idea is no longer probable. What is then probable is that there is an invisible germ. Surely you are not going to say that measles is not due to an invisible germ, or that this conviction of yours is unjustified, or that the ground for it is not the analogy between the symptoms of measles and the symptoms of diseases which have been found to be due to germs? The existence of the invisible measle germs is probable by argument by analogy, though, of course, not every one who reasonably believes in it sets out his reasons in such a way that this is quite apparent. The presence of the invisible measle germs can be

proved, Dr. Pantin the zoologist says. At the same time, he is perfectly aware that the reactions of the measle patient's blood to certain tests is no more a *direct* proof or verification of the existence of the germs than is the pattern of other symptoms the patient exhibits. We cannot know directly of the presence of the invisible germs, but we know of it indirectly by an argument by analogy with cases where our senses do not fail us so soon.

White. No doubt measles is due to an invisible germ. And no doubt what justifies us in saying this is the likeness of the symptoms of measles to the symptoms of diseases which have been found to be due to visible germs. No doubt that is the conventional way of describing the justification. What I want to insist upon is that " Analogy justifies belief in invisible germs " is only another way of saying " Until we looked it was probable by analogy that there were germs (visible) in the blood of patients suffering from measles but when we looked we found none ".

I own I ought not to have said that there is no justification for the belief that measles is due to invisible germs from the analogy of its symptoms with the symptoms of diseases due to visible germs. I should have insisted only on the idiosyncracy of the analogy. To say that analogy does not justify belief in invisible germs is to be like those who have said " Even if a thousand people of all sorts have got better from anæmia after taking raw liver it's nothing but a *post hoc ergo propter hoc* to argue that raw liver cures anæmia. The evidence doesn't really render the conclusion probable ". When such a thing is said we are revolted. But I want to insist that a little sophistical reasoning soon makes it attractive, soon shows that it's " really quite right ". Consider: The evidence surely couldn't make the conclusion probable, more likely than not, if that conclusion were too improbable to start with. No doubt the thousand cases eliminate certain alternative explanations which would not have been eliminated by only a hundred cases. But that doesn't tell us how many alternative explanations remain. And without knowing that, how can we be confident that the suggested explanation is the right one? At the same time, the fact remains that the thousand various and carefully studied cases are just what we do call good evidence for such a conclusion. Such evidence has made it more than probable that raw liver is the thing for anæmia. It is as absurd to say that the evidence ought not to have led to *some* confidence in this conclusion as it is to say that the information " Smith has twice as many goats as Jones and Jones has as many goats as fingers " ought not to lead to *equal* confidence in the conclusion " Smith has twenty

goats ". Or shall we say that it is as unconventional but not as absurd ? For the evidence couldn't be said to " increase the probability of the conclusion " if we meant by this " have the logical relations to it " which hold in the typical case of increasing probability, where the increase can be *calculated* ; and if the evidence can't be said to " increase the probability " can it be said to " justify increased confidence " ? Thus, although it's a tiresome eccentricity to say that high-class scientific evidence isn't high-class, I like the eccentricity. For it forces us to face our conflicting inclinations, and in avoiding it we begin to see that there are more logics than are dreamt of in the text books. And though when I said " The analogy between measles and germ-caused diseases does not give ground for supposing that measles is due to invisible germs " this was a tiresome eccentricity, it too will force us to grasp how unlike this ground by analogy is to the ground by analogy for expecting a visible germ which we haven't yet seen, and how like this *association of Xs visible or, if not, invisible with Ys* is to the *break-down of the association of Xs with Ys*. And grasping the idiosyncracy of the logic of the argument to invisible Xs we shall see how it is that to reply to " How do I know there are invisible Xs ? " with the response " By analogy " is to reply " In the way you do ".

By all means let us say, then, that analogy with cases of visible germs establishes the existence in other cases of invisible germs. But remember that analogy with visible currents establishes invisible currents. And that a leprechaun is a sort of germ. The singing of songs and the mischievous tricks of a grandfather clock are good evidence for the presence in it of a leprechaun, because often with grandfather clocks when we have observed the former we have found the latter. And when a watch shows analogous symptoms we have good evidence by analogy for the presence of a little leprechaun in it, at least until we have found there isn't one. And by all means let us *still* say that we have good evidence by analogy, even when we have looked and found there isn't one. Call it good evidence if you like, call it argument by analogy proving the existence of things it is beyond our senses to detect, but notice that it is uncommonly like those cases where we say " But it was found that here the analogy breaks down ".[1] " Amongst the larger termites we find societies in which there are workers, nurses and soldiers who guard the queen. Analogy would suggest a king. But observation shows that this is not so."

[1] " It was found that that feature of the positive analogy of the hitherto examined instances, *viz.*, being clocks and not watches, was after all not irrelevant."

Or shall we say that the drone is a king but that when he comes to the throne he is deposed at once?

But take no notice of my gibes. You are doing the done thing. The way in which phenomena at one end of an electrically-charged wire are connected with phenomena at the other end reminds us of the way phenomena at one end of a pipe carrying water are connected with the phenomena at the other end—an electrical system reminds us in many ways of an hydraulic system. And this resemblance provides evidence by analogy for there being a current of something running through the wires of the electrical system; it is analogy between what we now experience from the wires and what we have experienced from pipes which makes us think there must be a current of something in the wires. Experience then supports this idea. But doesn't it also refute it, when we look and find no current of anything in the wires? Not at all. Don't let this gibe put you off. What we in fact choose to say is that experience supports the theory, though it shows the current to be very disappointingly unlike the current in pipes. That is what we say. You are quite right. Only remember that we say that you and I have the same father because there are *not* two fathers, the one yours and the other mine, and also say that you and I have the same picture because there *are* two pictures, the one yours and the other mine, and they are just alike. This is the sort of thing which is apt to make a furniture remover say that really you and I have not the same picture. He says this because, though the situation resembles in important respects the situation in which there is only one picture between the two of us, it also differs from that situation. And the way it differs is just the way that is important to the furniture remover in guessing how large a van will be needed to remove our effects. Like the furniture remover, when I am concerned with removing the difficulty "How do we ever know from our sensations of the existence of material things?" I am inclined to contradict one who answers "By analogy". For the analogy differs from other analogies in exactly the way which produces the original difficulty with regard to the knowing. The only analogies it doesn't thus differ from are other arguments by analogy to invisible things where the same difficulties are felt. It isn't that we don't know of the existence of invisible things, but that we do and that there's something queer about the knowing. And again it isn't that we don't know of their existence by analogy, but that we do and that there's something queer about the analogy. Something very queer. This is what you called the peculiar grammar of

the expression 'invisible things'. When you insisted on recalling that peculiar grammar you were insisting on my point. For the peculiar grammar of that expression is the peculiar logic of invisible things. And that peculiar logic is what I am insisting upon. And I insist upon the idiosyncracy of the logic of invisible things and of chairs and tables and of minds because this is another way of insisting upon the idiosyncracy of the relationship between the phenomena in which these things manifest themselves to us and these things themselves, between the basis of our knowledge of these things and these things, and this is a way of grasping the nature of these things.[1] One way of getting a better grasp of a new machine is to see how far it resembles a gyro-tiller, or if it is a gyro-tiller how far it differs from all the old ones. To examine how far in these cases the step from the signs to what they signify is argument by analogy and, granting that it is, how far it differs from the step by analogy from the likeness of two animals, and the presence of teeth in one, to the presence of teeth in the other, or the step from the likeness of a new, enormous animal to familiar animals with teeth, to the conclusion that in the mouth of the new animal are teeth bigger than any we have ever seen—to examine all this is to answer the questions "How do we know that there are any invisible germs?", "How can we justify our confidence that there is anything beyond our sensations?", "What justification is there for our confidence that thoughts and feelings prompt the behaviour of others?" Metaphysics comes from obsessional qualms about the use of 'justify', a Pharisaism in Logic instead of in Morals or Art.

[1] (i) The verification principle follows from the doctrine that all necessary propositions are analytic and (ii) the doctrine from the principle. As to (i): (*a*) all propositions of the form P has R to Q, where R is a logical relation, are necessary, whether of the form P entails Q or of the form P is entailed by Q or of the form P lends probability to Q or of the form P is lent probability by Q. Call these propositions the logic of P. (Of course, "The murmur makes a leaking valve probable" is not a necessary proposition. It is not a logical proposition. You don't get a logical proposition till you add the rest of the data.) Now (*b*) If Q is involved in the meaning of P then P entails Q. From (*b*) we have (β) if Q is involved in the meaning of P it is included in the logic of P. From (*a*) with the doctrine that all necessary propositions are analytic we have (α) that everything included in the logic of P is involved in the meaning of P. From (β) and (α) we have the verification principle that if two statements have the same logic they have the same meaning, and that if two statements have a different meaning they have a different logic, with the useful corrollary that every different sort of statement has a different sort of logic.

XUM

Let me put the thing another way. People sometimes ask "How do I know of the existence of sensations of pain and hunger and so on in others?" and receive the answer "By analogy" and are satisfied. And people might ask "How do we know of the existence of invisible germs?" and receive the answer "By analogy" and be satisfied. Now here is a point of great interest, because people sometimes say to me "You don't seem to bother about what is true in philosophy. You only concern yourself with stopping people from complaining. Your object, you say, is to satisfy them". Well now, here I am going to say that people oughtn't to be satisfied with the answer "By analogy", not even if it satisfies lots of people, any more than they ought to be satisfied with *The Way of an Eagle*, by Ethel M. Dell, although it sold 50,000 copies. Of course, *The Way of an Eagle* didn't sell like it did for nothing. Nor is it for nothing that the answer "By analogy" appeals so much. It gives satisfaction. But the satisfaction is unstable. It too readily gives way to new dissatisfaction, especially if someone taps, like you did, on the weak place in the answer, and says "But invisible germs aren't the same sort of thing as visible germs in the way that larger teeth are the same sort of thing as smaller teeth". It is true we may argue by analogy to the existence of things of a sort different from any we have seen. When we see a new enormous animal we expect bigger teeth than we have ever seen, and when we see a new tiny animal we expect tinier teeth than we have ever seen, both by analogy with animals and teeth we have seen. But now that this argument is set down beside the one about the germs it is clear that it is different. It's especially clear when we notice that before we have looked and found no germs *then* the position is like that which we describe as knowing by analogy that this animal will have big teeth. But after we have looked, *then* the position is very different, and to describe it also as knowing by analogy that there are germs seems too near to saying that when we find that the enormous animal has no teeth what we find is that it has invisible teeth. In other words, looking at the arguments side by side people may begin to say "But is this argument for the germs argument by analogy?" They are like people who . . .

Gray. Forgive my interrupting. But do you wish to say the answer "By analogy" is correct, or do you not?

White. The matter as to whether in the special context described it is a correct answer I leave to you. When Shelley wrote "Bird thou never wert" was what he said incorrect?—in view of the fact that on the outside of the book was written

" Poems " was what he said incorrect ? In view of the fact that he said that the skylark is not a bird, when of course it is, was what he said correct ? Whether or no it is correct to say to the furniture remover that you and I have the same picture is as maybe, but it is certainly either misleading or tiresome. And to reply to " How do we know from outward signs inward states ? ", " How do we know from the effects of the external world on us what it is really like ? ", " How do we know from visible signs that a patient has invisible germs in his blood ? "—to reply to these questions with the answer " By analogy " is very apt to be bogusly soothing and thus misleading.

It wouldn't be so misleading if it weren't correct, just as it wouldn't be so misleading to say that " There is an electric current flowing in this wire " means more than " This wire gives off sparks, etc." if it weren't correct. It wouldn't be so misleading to say that the hypotheses of a brownie and of a leprechaun are different hypotheses if it weren't correct. Suppose a man sees a coyote for the first time. " Now ", he says, " is this a wolf or a fox ? "—with a sort of chuckle he asks this, because he fancies he is asking a riddle. Your answer " It's neither. It's a coyote " wouldn't be so misleading, so inappropriate, if it weren't correct. How inappropriate your answer is depends on how much the man who asked " What's this now ? Is it a wolf or a fox ? " was putting a riddle instead of asking a question of logic, *viz.*, " What is this animal called ? " Now the man who asked the question chuckled, and that was because he thought he was putting you in a certain kind of difficulty. You prick the bubble with which he proposed to play. Maybe he now becomes confused, or maybe he becomes irritated. Maybe he doesn't notice that he might now ask " And are coyotes foxes or wolves ? " And if he did wouldn't you answer " They are neither " and answer correctly ? And probably he wouldn't even then realise that you aren't playing his game. You see he's playing his game with pieces habitually used to play the game you are playing, and that prevents his realising properly that though he's using those pieces he's playing a different game. So he's misled into an unwilling silence. Or maybe he finds your answer tiresome. You don't see his point, he says, but alas, he finds some difficulty in explaining what it is.

But there's another reason why the answer " By analogy " appears good. If it were entirely clear what questions they are which are asked by one who asks " How do we know of the existence of invisible things ? ", " How do we know of the existence of trees and water ? ", " How do we know of the

existence of thoughts and feelings?", then the answer "By analogy" wouldn't be so attractive, and thus less of a trump-card in the hand of the Devil. But the questions are not clear. When someone asked me "How do we know what we know in memory?" I replied "By experience". And if asked "How do we know what we know in perception?" I might likewise reply "By experience". How does your dog know when he hears your voice that you are in the hall? By experience, by analogy; for he knows your voice, he has learned—at first he didn't know—that that voice is associated with you. It's only when someone asks the absurd question "How does he know it's you when he's seen you, smelt you, pawed you, licked you, and chewed your gloves?" that the answer "From experience, by analogy" becomes absurd. It is true that the queerness of the last question begins in the first, that the queerness of the last answer begins in the first. But it only begins.[1] It would be absurd to deny that it was from past experience that when you smelt burnt almonds this afternoon you expected prussic acid or, possibly, burnt almonds. In the past that sort of smell has been associated with prussic acid and burnt almonds, very like the chattering of the jay birds has been associated with the presence of a fox. Very like, fatally like. And yet it is easy to see that there is something queer about saying that having smelt Eau de Cologne one argues by analogy that the stuff in the bottle is Eau de Cologne.[2] This same queerness begins in "It smells like cheese, but *is* it cheese?" But though it begins here it doesn't reach a maximum until we have such a question as "To all of us it looked as if there were cheese in the larder, and it felt, smelt and tasted as if there were, and I am sure that no one else would have detected anything to the contrary, and I am sure that no one ever will detect anything to the contrary, but can we be sure that there really was cheese there as opposed to being sure that everything will go on seeming just as if there were?" And it is not until we reach this very queer question that the answer "By analogy" is so very queer.

[1] See MIND, N.S. 196, p. 400, paragraph 2.

[2] We are apt to assume that what holds for chairs and tables in the philosophy of the external world holds for all physical things. But even within the category of physical objects there are differences in logic. This isn't anything new. Everyone knows that "having legs" is relevant to "is a chair" in a way in which it is not to "is a cushion". But there is a point in bringing together under one name all differences in what counts for and against a statement, and there is a point in drawing the line between differences in logic (form of argument) and differences in definition (content of argument) in various eccentric places between the ordinary and the limit which gives every statement a different logic.

Gray. What do you mean " queer " ? And you have been explaining why the answer looks good, but to prove it misleading, meretricious, pretentious, it is necessary to show too how it's bad.

White. Well, that's what I've been trying to do ever since I began talking about the queerness of putting ' probably ' before " There is bread in the larder " and before " Smith feels sick ".

Gray. But if the question is " How do I get from these signs to this conclusion ? ", and the answer given is " By analogy ", and you allow that that answer is correct, isn't that the end of the matter ? Surely the only question is " *Is* it correct ? " ? But you seem to think that its being correct doesn't prevent its being a bad answer, bad, I suppose, in that it's what you call misleading. But *how* is it misleading ?

White. That's what I've been trying to explain. You say " It's correct, surely that's the end of the matter ". You have already forgotten the man who asks " Is this a wolf or a fox ? " My points are (1) that whether it's correct or not is not the point and then (2) that it's misleading. Allow me to take two other examples of my sort of procedure in philosophy. You remember how it was said that " There's a leprechaun in this watch ", even in the special usage we described, would not mean the same as " This watch sings fairy songs on being politely asked, especially when the moon is full, etc.", and you remember, too, that correct as this statement is it is most subversive, because it prevents our noticing the difference between the relation between the use of " There are here all signs of a leprechaun " and the use of " There is here a leprechaun " on the one hand and the relation between the use of " There are here all signs of malaria germs " and the use of " There are here malaria germs " on the other. It is bad to prevent our noticing this because it includes preventing our noticing the difference between the question " There are, it is true, all signs of leprechauns (measle germs) in these watches, but I wonder are there really any ? " and the question " There are all signs of malaria germs in these people, but I wonder are there any (or is it Malta fever) ? " And this is bad because to prevent our noticing the difference between these questions is to leave us to try to deal with the leprechaun question by the same technique as is available for the malaria question, *viz.*, further investigation. And when this technique proves impossible with the leprechaun question we feel as we feel when we haven't a microscope and so can't employ this technique on the malaria question. The only difference, it then seems to us, is that the former feeling is hopeless, while the latter is not,

because we can save up to buy a microscope. We don't see the inappropriateness of feeling the same feeling with regard to the leprechaun question because saying, as we have said, that to assert the existence of a leprechaun is to assert something more than and different from the presence of the signs of its existence we then treat the relationship between these two assertions as like that between typical cases in which we say of one assertion that it is different from and involves more than another, as in " 'She's half sister to Royal Minstrel' means more than 'One of their parents is the same', it means 'Their dam is the same' ". Take the thing the other way round. To say " The sentence 'There are measle germs here' means something different from what the sentence 'This measle patient gives every germ-reaction' means " is bad because it's unduly worrying. You remember it was said—to stop the worry it was said—" 'He has the measle germ' just means 'He gives and will give all the measle-reactions' ". Now this was incorrect. But that again is not the point. The point is that this answer is too soothing. Or rather not too soothing—nothing could be that, everything's absolutely all right in metaphysics—but it's too slickly soothing. It's soothing without requiring of us that act of courage, that flinging away of our battery of crutches, which is required in order to realise that everything's all right. This phenomenalist answer soothes without demanding this change of heart only by soothing deceptively and saying that this alarming hippopotamus is only a horse that lives in rivers. It's true that the hippopotamus is quite O.K. and not at all carnivorous and won't hurt anyone who treats him right—that is, treats him like a hippopotamus has to be treated; but it's a mistake to soothe people about him by telling them that he's a horse because, though that may soothe them for the moment, they will soon find that to treat him like a horse is not satisfactory. Or if you do tell them that he's a horse, then you must at once explain just how this is misleading, whether because, though it's correct that he is a horse, he differs from all other horses in the following respects relevant to their attitude to him, or because, though like a horse, he isn't one, and differs from them in the following respects relevant to their attitude to him.

Now the answer " By analogy " is another deceptive soother. It happens (1) that it is not incorrect and (2) that the case where it is so very deceptive is, as we have noticed, not sharply separated from cases where it is but little deceptive. But these things only make it the more dangerous, like the hippopotamus's being properly called a river-horse and eating grass. You will

remember it was the same with the statement " ' There are all signs of an electric current ' does not mean the same as ' There is an electric current here ' ". This statement is (1) quite correct and (2) only thoroughly misleading when ' all signs ' is eccentrically taken to mean quite literally *all* signs, *i.e.* so as to leave none behind. Indeed, these issues " Is the step from *There are here all signs of germs* (*of bread*) (*of pain*) to *There are here germs* (*bread*) (*pain*) argument by analogy ? " reflect the issues " Does ' There are here all signs of measle germs (bread) (pain) ' mean the same as ' There are here measle germs (bread) (pain) ' ? " In short, the " Is it analogy ? " controversies reflect the " Do they mean the same ? " controversies.

Black. Yes, and may I point out that the reflection doesn't fail to reproduce the *difference* between the germ, the bread and the pain issues ?

White. Certainly, certainly, but give me a chance. That indeed, as we found, is where the rub is. But we are coming back to that. At the moment the point is to explain why it's misleading to say that we know by analogy that there's bread in the larder and even (for these two are different, too, as no doubt you would wisely point out) misleading to say that we know by analogy that there are invisible germs in a man's blood. And what I am first saying about how it is misleading is that it misleads like " They mean the same " and also like " They don't mean the same ", in some ways like the one and in some ways like the other. And what I want to say further is that in these cases of germs, bread and pain, and in other philosophical cases, the features of the relationships between the signs and the signified which lead to the controversies as to whether the signified is constituted by the signs are the very features which lead to the controversies as to whether the steps from the signs to the signified are arguments by analogy.

Gray. Still you won't say what these features are.

White. I have. If you still ask " What are they ? " I shall say what we've said already. Someone said " How about this step from our sensations to the real physical things which cause them ? How about this step from behaviour to the inward states, the thoughts and feelings behind it ? Is it all right ? Some say that there is no step, some that there is a step but that it is quite unjustified ". Gray replied, " There is a step and it's justified ". Black said, " How ? " Gray said " By experience. By induction and analogy. You know, it's like the step from the chattering of the jays to the passing of a fox, from presystolic murmur to leaking valves, from leaking valves to death

to-morrow". Black said "Not quite like that surely. For these arguments depend on premises reporting experience. We say 'Whenever I've heard the jays like that it wasn't long before hounds . . .'. We say 'When there's that murmur it's always found that the valves have been leaking'. But we can't say 'Whenever I've seen, smelt and tasted bread I've soon found bread'. For if we say (1) that 'finding bread' is something different from getting the sight, smell and taste of it, then we have never found bread, and if we say (2) that it is the same, then we can't say that we have often *first* got the smell and taste and sight of it and *then* found it. Whichever we say we can't represent the step from sensations of bread to bread as like that from the chattering of the jays to the passing of a fox. For if we say (2) the step is an immediate inference, and if we say (1) it is an argument by analogy with a false, if not unintelligible, major premise". Gray said "Well yes, there is some difference". "*Some* difference!" we said, "There's all the difference. The bread case differs from ordinary, orthodox, thoroughly accepted cases of analogy in just those ways which leave us where we were, because they leave us saying 'On the one hand it looks as if there is no justification for this step because there's never been a time when we have observed besides the signs the signified, while on the other hand it looks as if the step is only too well justified for us to speak of justification, because it's so well justified that there is no step'." That is, the bread case differs from the steps from the chattering of the jays to the passing of a fox, from presystolic murmur to leaking valves, in such a way that we can say that it's the same sort of step only by insisting that it's the same sort of step although it differs either in that its premise reporting experience of association between signs and signified is quite false, even if it's intelligible, or in that that premise does not really report experience but is a logical principle, so that to put 'probably' between the premises and the conclusion is absurd. In this way it comes out that we are back to where we started from. We started from a hesitancy as to whether to accept the paradox that we don't really know that there is bread in the larder or to accept the paradox that there is bread in the larder means no more than that it will always seem as if there is now bread in the larder. What we now see is that to describe the situation—the relation between our knowledge of what we can see, smell and taste and our assertion that there is bread in the larder—by the name of 'argument by analogy' doesn't alter its features. These features made us hesitate to say that we can see, smell and taste bread

and not know that there is bread there, and also made us hesitate to say that there is bread there means no more than that it will always seem to everyone as if there is now bread there. These same features now make us hesitate whether to say that the argument by analogy by which we step from signs of bread to bread is founded upon a falsely favourable report of our experience, or to say that it is an argument in which the conclusion that there is bread is no more than a redescription of the premise that there is sight, smell and taste of bread. The avenger of blood hesitates when he sees the man who killed his father playing with his children and mutters "Can it be right to kill this man?" We say "But it's your filial blood-bond". But the avenger of blood, even if he doesn't question that it's his "filial blood-bond" (well-known phrase in the tribe), will still—if he doesn't think by labels he will still be uneasy and say "But is it always right to do what is the keeping of my filial blood-bond?" Likewise the philosopher who, suddenly questioning himself and others, says "But is it right, this step from sights, smells and tastes of ours to bread?" "It's the right of argument by analogy" we say. But if he doesn't think by labels—"a rose by any other name" smells just as sweet, or not, as the case may be—if he doesn't think by labels, then he will ask, "Well, but then is this sort of argument by analogy all right?"

Gray. Yes, yes, I remember. But then I admitted that it's not *that* sort of justification by experience which the justification of our confidence in the existence of bread is like. What it is like is the sort of argument by analogy from A to B which is based on the association not of A with B but of something like A with something like B. It is like the justification of our belief in measle germs which we have never seen, from our experience in other diseases of the association of a pattern of symptoms like that a measle patient exhibits with visible germs.

White. It's not like our expectation of measle germs (in fact invisible) while we still expect them to be visible. While we still haven't looked with the microscope our justification for our confidence in the existence of measle germs differs from our confidence in the existence of bread in the following way: while we still haven't looked, and are thus still expecting visible, though perhaps oddly shaped, germs, we can well understand someone who says "Probably there are germs there, but perhaps you will find there are none". Now in the case of the bread we cannot understand what it would be like *to find* that what all the evidence suggests is so is after all not so. I do not say that we cannot understand, that it's meaningless to suggest, that what

all the evidence suggests is so is in fact not so. What I am claiming here is that in the bread case we don't understand the suggestion that we might *find* that what all the evidence suggests is so is not so. This proves it unlike the justification of the belief in visible germs. But of course this very feature makes it like the justification by analogical extrapolation of our belief in *invisible* germs. For in the case of invisible germs it is once more impossible to understand the suggestion that we might *find* that what all the evidence suggests is so is not so.

Gray. There you are. My answer "By analogy" was quite right. It amounted to the answer "You are troubled about the step from signs of bread to bread. Don't be troubled. It's a species of argument by analogy. Not of the familiar species, 'This dog's like the one that bites, so probably he bites too', but of the species by which we establish the existence of germs we cannot see and do not expect to see".

White. Undoubtedly that is the species. Now arguments of that species, as we have just seen, are different from other analogical extrapolations, *i.e.* arguments of the form

(i) *Here is a pattern of phenomena* $A(a_1 \ldots a_n)$.
(ii) *Similar patterns* $A'(a'_1 \ldots a'_n)$, $A''(a''_1 \ldots a''_n)$, *etc., have been found to be due to things* B', B'', *etc.*
(iii) *We may then expect here that the phenomena* $A(a_1 \ldots a_n)$ *are due to the presence of a thing* B.

They are different in that in them B differs from B′ and from B″ not merely in a way in which B′ and B″ differ from one another but in that the finding of B here could include nothing not included in the finding of $A(a_1 \ldots a_n)$. For arguments of this species have this in common: that the thing whose existence they establish is known only by its effects. The consequence is that we cannot say of these arguments that however good the evidence in them we can always understand the suggestion that we may nevertheless find their conclusions false or find them true. On the contrary, when the evidence is supposed so good as to include all the effects of B we cannot understand the suggestion that we should find that B doesn't exist. If B is known only by its effects, then the nearer does a set of phenomena come to including all those effects the nearer does an argument from those phenomena to B come to being an immediate inference. And when the phenomena include *all* the effects, all the signs, *i.e.* when the argument, is like the bread argument, a perfect member of the species which interests us, then the argument becomes quite an immediate inference. It involves, if you like,

an empirical generalisation, *e.g.* in the germ case the generalisation "In other diseases such symptoms have been associated with germs", and the conclusion, if you like, means more than the statement that $a_1 \ldots a_n$ are present, it means also, if you like, that such phenomena are usually found associated with Bs, *e.g.* germs; but the fact remains that the conclusion is no more than a way of redescribing the evidence. This comes out in the fact that the evidence is of a sort which we might well choose to describe by saying that though patterns of phenomena like $a_1 \ldots a_n$ have been hitherto associated with Bs the present case shows that this association breaks down. This comes out, in the case that primarily is interesting us, in the fact that if someone says "I know by analogy, from the association of groans from my body and pain, that behind the groans of others is pain" then we feel inclined to say "You might as well say that you know from the groans of other bodies unaccompanied by pain that the generalisation which holds so well for your own body fails for others". Now it isn't that we don't know which conclusion is correct, but that we have to choose which way to describe the facts.

Black. But this is different. We have never experienced bread apart from the sight, smell and taste of it, and it's impossible to experience invisible germs except through their effects. But in the case of pain we have in our own case found certain behaviour associated with something else—a sensation of pain.

White. Yes, and each of us also finds many instances of such behaviour without pain, so each of us had better conclude, as I have just suggested, that though when *his* body shows these symptoms pain is to be expected, when other bodies show these symptoms it is not. And that is what we in fact do, we do not expect pain when we see a wound in the side of another.

Black. We don't expect pain for ourselves, but we do for him.

White. We are back to where we were. There is a difference between the relation between the members of the pair "There are all the symptoms of germs, and there will be" and "There is an invisible germ here" and on the other hand the relation between the members of the pair "There will be all symptoms of pain here" and "There will be pain here". This difference is one which one may fairly describe by saying that in the latter case one who expects that there will be pain expects something different from one who expects nothing but symptoms of pain, while in the former case, though there is a difference between one who says "There will be invisible germs in his blood" and

one who says "There will be all symptoms of germs in his blood, but no germs", this difference is not one in their expectations. They both expect the same.

Gray. The difference between the pairs isn't as sharp and absolute as you two make out. For on the one hand someone might say, "One who expects invisible germs expects something different from one who merely expects all symptoms of germs, this isn't merely a difference in the pictures with which they work, like the difference between one who says 'The sun is going down' and one who says 'The earth is turning from the sun'". And then on the opposite side someone might say "Whether one says 'He will be in pain' or says 'He'll still complain' one's expectations are the same, only one's feelings are different".

White. The fact remains that there *is* a difference. There *is* much *more* inclination to say that when I expect that Smith will be in pain I really expect another fact besides the symptoms of pain than there is to say that when I expect invisible germs I expect another fact besides the symptoms of them. And this difference now comes out in the inclination to say that while the inference to germs isn't really an argument by analogy, but only a "summing up, redescription of the evidence", the inference to mental states in others is a real inference, is a problematic inference, is an inference based on analogous experience in other cases.

Black. As you say, there is a difference between the differences. There is a difference between one who expects that Smith will have invisible germs in his blood and one who expects merely that he will show all signs of such germs. But this we have seen through, we know what sort of difference in expectation this is. Again, there is a difference between one who expects that there will be a loaf in the larder and one who expects merely that all our sensations will be such as they would be if there were a loaf in the larder. But this difference is very like the difference between the man who expects invisible germs and the man who expects merely all symptoms of invisible germs. On the other hand, between the man who expects that Smith will be colour blind to-morrow and the man who expects merely that he will give all signs of being colour blind there is a real difference in what they expect, and there is a real difference in what they expect between a man who believes that to-morrow Smith will be in pain and one who believes merely that Smith will give all signs of being in pain.

Gray. And this difference in the relations between the signs and the signified now comes out anew in the fact that, while to

find visible germs associated with a pattern of symptoms is not to find something analogous to invisible germs, to find oneself in pain is to find something analogous to pain in others. So that even when we say that the argument to invisible germs is not a genuine argument, much less a genuine argument by analogy, we may yet insist that the argument to pain is a genuine argument by analogy.

(To be continued.)

XUM

II.—COOK WILSON AND THE NON-EUCLIDEANS.

By E. J. Furlong.

My object in this paper is to examine certain views of Cook Wilson on space and geometry which would be regarded as heretical in many quarters to-day. I shall begin by quoting some passages from Mr. Russell's *Principles of Mathematics* which state the kind of view to which Cook Wilson was opposed.

"Geometry," wrote Mr. Russell, "may be considered as a pure *a priori* science, or as the study of actual space. In the latter sense, I hold it to be an experimental science, to be conducted by means of careful measurements. . . . As a branch of pure mathematics, Geometry is rigidly deductive, indifferent to the choice of its premisses, and to the question whether there exist (in the strict sense) such entities as its premisses define." [1]

Mr. Russell held that the figure is not essential to geometrical reasoning. "Space is, as Peano remarks, a word with which Geometry can very easily dispense." [2]

Lastly, he asserted that Euclid's premisses are not all self-evident. "For the Kantian view [of Geometry], it was necessary to maintain that all the axioms are self-evident—a view which honest people found it hard to extend to the axiom of parallels." [3]

Cook Wilson's elaborate attack on the notions of non-Euclidean space and non-Euclidean geometry is based on a denial, almost in as many words, of these statements of Mr. Russell. He held that geometry is the *a priori* science of the properties of space, that a figure *is* essential to geometrical reasoning, and that we know, not by measurement, but by *apprehension*, that space is Euclidean.

Cook Wilson was convinced that the mathematicians who had evolved non-Euclidean geometry were bereft of any ability to philosophise on mathematics. Hence he tried hard to find some contradiction in this "pseudo-geometry" which would convince "the rank and file of mathematicians", so that "they would at least not suppose the philosophical criticism by which I intended anyhow to attack, somehow wrong".[4] In the long run

[1] B. Russell, *The Principles of Mathematics* (1st or 2nd ed.), p. 372.
[2] *Ibid.*, p. 437. [3] *Ibid.*, p. 373.
[4] p. xcvi. (The references are to the pages of *Statement and Inference*, unless otherwise stated.)

he had to admit that his efforts to discover such a conclusive contradiction were unsuccessful; but if his "philosophical" refutation is valid, his results may be of great importance for mathematical theory. They would show, for instance, that much that has passed for geometry is not geometry at all. I do not know of any direct answer to him which has been published, so that an attempt to examine his views may not be out of place.

Before stating his argument I shall first dispose of one or two preliminaries. The first is to state Euclid's fifth postulate, to which I shall later frequently refer. It is as follows: "If a straight line falling on two straight lines make the interior angles on the same side less than two right angles, the two straight lines, if produced indefinitely, meet on that side on which are the angles less than the two right angles".[1]

The second preliminary is to give the *O.E.D.* definitions of non-Euclidean geometry and space: "Non-Euclidean geometry is a system of geometry involving the study of the consequences which follow from the denying (or, in a wider sense, merely dispensing with) any of the assumptions on which the Euclidean system is founded". "Non-Euclidean space is the kind of space with which this geometry deals."

The particular non-Euclidean geometries with which Cook Wilson was concerned, were the systems in which Euclid's fifth postulate is denied.

I shall now state Cook Wilson's argument. (Cook Wilson does not state it anywhere in the following fairly concise form, but I am giving what seem to be the strongest of the points he urges. He has one or two other strings to his bow, but since they are rather replies to possible objections than direct arguments I do not intend to consider them.) The argument may be divided into three stages:

(1) Cook Wilson holds that we can know, in the strict sense, that Euclid's fifth postulate is true, because a "really self-evident" proposition exists from which it may be derived.[2] The other assumptions of Euclid are also true, so that our space is Euclidean, and non-Euclidean space is a "chimera".[3]

(2) The method of advance in geometry is not by syllogistic inference from a number of first principles; the true account is that geometry advances by making geometrical constructions; "the validity of such constructions is a matter of immediate spatial intuition, and so also are the consequences inferred from

[1] *The Thirteen Books of Euclid's Elements*, tr. Heath, 2nd ed., p. 202.
[2] p. 561. [3] p. 456.

these constructions in the way of other geometrical relations which they necessitate ".[1]

(3) Since from (1) our space is Euclidean, it follows that we can draw no figures which obey non-Euclidean assumptions; hence by (2), no advance from such assumptions is possible, *i.e.* there is no such thing as non-Euclidean geometry.[2]

There is one other contention of his which I intend to consider. I refer to his attempt to show that the body of propositions which goes by the name of non-Euclidean geometry is achieved by an unconscious use of Euclidean space.[3] This contention is not a part of the argument I have just stated, but it is relevant to his position; for it is obviously important that one who claims to have shown the impossibility of non-Euclidean geometry should also point out the mistake which has given it the appearance of possibility.

The third of the three steps of his argument is an inference from the first two. I propose to consider the latter now, taking them in the order in which I have stated them.

(1) The self-evident proposition from which Euclid's postulate is to be derived is as follows: " ' If two straight lines have a third perpendicular to both of them, the first two are always at the same distance from one another.' . . . Or, what comes to the same thing, given a straight line AB and a straight line DC, perpendicular to it and of finite length, any line through D, such that the ordinates from it to AB are not equal but increase or decrease on both sides, cannot be a straight line but must be bent. That this is so, is absolutely self-evident. From it Euclid's axiom can easily be derived; and from it the refutation of these hyperbolic and elliptic systems." [4]

There are two points in this first thesis on which I wish to comment: (*a*) Cook Wilson's view of geometrical entities; (*b*) the validity of his postulate.

(*a*) Cook Wilson has used the term " straight line ", and it may be asked how he defines this term. As a first step to answering this question I shall show how he deals with *lines*. He does not, as far as I can discover, define a line as " that which has length without breadth ". He uses instead the property stated in Euclid I, Def. 6, " the boundaries of a surface are lines ". Thus we are told that " if two colours are juxtaposed which do not shade off imperceptibly into one another, *i.e.* two colours homogeneous in themselves—as the coloured blot on white paper, we necessarily perceive their common boundary as linear. . . . We ' perceive ' the limit or boundary just as directly as we do

[1] p. 455. [2] p. 457. [3] pp. 566 f. [4] p. 561.

the colours." [1] (This treatment of lines as the boundaries of surfaces seems satisfactory to me, and it suggests a method of making geometrical constructions which is perhaps less open to objection than the one usually employed. We might make these constructions by means of different colours, whose common boundaries would be the lines of the figure. Thus we should conform more closely to Euclid's definitions. Our lines would have length without breadth; our triangles would be plane figures, that is, parts of surfaces, not, as the ordinary figure might suggest, structures composed *per impossibile* of three breadthless rods.[2])

So much for the nature of Euclidean lines. Cook Wilson holds that they do exist, and that we do perceive them. But now, what has he to say about *straight* lines? Do *they* exist, and if so, are we ever acquainted with them? More generally, are we ever acquainted with such figures as Euclidean triangles and circles? It might be held that we never are. Mr. Austin, for instance, seems to suggest this when he remarks that, for whatever reason, we never say "*This is* a (geometrical) circle".[3] Cook Wilson's view may be gathered from the following passage: "A figure in experience might be in itself perfect . . . yet we should have no means of ascertaining that it was perfect, and so its perfection would not be *experienced* by us. . . . We certainly must *think* of a perfect figure, for on that our proof depends . . .; we apprehend, that is to say, a particular, and in some sense we apprehend the perfect particular. . . . We seem to arrive at a new and important distinction in our faculty of apprehension." [4] And later he calls this a "peculiar kind of apprehension".[5] His position, therefore, is that there is no reason why, for instance, straight lines should not exist; and we may indeed perceive them, but we can never know when we are doing so. Yet, for all that, we can discover by inspecting not-so-bent lines what the properties of straight lines are.

What shall we say about this view? It seems to me that Cook Wilson is right in holding that straight lines may exist and that we can discover their properties by inspecting nearly-straight lines, but wrong in denying that we are ever aware of perceiving them. I admit that we perhaps never do say "*This is* a straight line", but I think that our caution in this matter is due to

[1] pp. 781 f.

[2] The method I have just sketched has probably often been suggested before. I mention it only to support Cook Wilson's treatment of Euclidean lines as perceivable entities.

[3] *Arist. Soc. Supp. Vol.*, xviii (1939), p. 88 *n.*

[4] p. 457 (italics mine). [5] *Ibid.*

a mistake. It seems to me that we are frequently aware of perceiving straight lines. Let us suppose that we are looking at a line in which we can see no bend; for example, the edge of a roof against the sky. Then I think we can truthfully say, "I know that this is a straight line". What makes us cautious is, I suggest, that we find it hard to escape from thinking that if we were nearer, or had a pair of field glasses, or a "powerful-enough" microscope, we could detect a bend in it. In other words, we are disinclined to take what we see at its face-value; and it seems to me that our prudence, desirable as the quality may be in other matters, is mistaken here.

However, even if I am wrong in this, and we never are aware of perceiving straight lines, we can "think away" the imperfections the figures we draw (or imagine) may contain.[1] This process of "thinking away" is, perhaps, all that Cook Wilson's "peculiar kind of apprehension" comes to when it is examined; so that this suspicious-looking activity may be only a sheep in wolf's clothing.

(*b*) I now come to the question of the postulate's validity. If we were to suggest that the way to test the truth of the postulate is to take three straight lines and see whether the postulate is true of them, we *might* satisfy Mr. Russell, but we should hardly satisfy Cook Wilson; and for two reasons. First, such an experiment would not verify the postulate (though it might falsify it) since it is a universal proposition: it states a property of all sets of three straight lines. Secondly, we have just seen that he thought we could never know whether a line is straight; therefore he would maintain that the experiment could not be done. There is, perhaps, a third reason why the suggestion might be considered futile, though I am not sure what Cook Wilson would have thought of this reason. I mean the fact that we should need to make assumptions about the rigidity of our measuring-rod, and that we might be reduced to admitting that the question whether the postulate is true admits of two answers: the affirmative answer, if we make one set of physical assumptions, the negative, if another.

Since the test by measurement is not acceptable, what has Cook Wilson to offer instead? His answer is that the postulate is "absolutely self-evident". Now what did he mean by this? So far as I can discover from the phrases he uses in this connexion,[2] the least he meant was that he apprehended (or knew)[3] that his,

[1] I owe this suggestion to the Provost of Oriel, to whom I am indebted for many valuable criticisms. Mr. Maclagan has also given me much help.

[2] pp. 562-567.

[3] Cook Wilson often uses "apprehend" as a synonym for "know".

and therefore Euclid's, postulate is true. Thus, when he speaks of the proposed [*i.e.* non-Euclidean] constructions as not being possible for our faculty of apprehension, he is implying that the only kind of space we can apprehend is Euclidean. Let us see what this claim to know that space is Euclidean implies. It is certainly a bold claim, and one which many would consider to be rash. According to Cook Wilson's strict use of the word "know", if I know that A is B, then A *is* B. Similarly, if I know that A necessitates B, then A *does* necessitate B; and on this matter of necessitation there are two theories which he rejects. The first is the theory that what we have is a necessity of apprehension, not an apprehension of a necessity. This view, which he ascribes to Kant, he denies more than once;[1] he holds that we can and do apprehend necessitations between elements of reality; for example, between a figure's having three sides and its having three angles.

The second theory which he rejects is "that the inconceivability of the contradictory of a statement is the test of its truth, and specially that it is *the* test from which we really derive the certainty of axiomatic truth".[2] He rejects this because he holds that there is no test of apprehension external to itself When we know, we know that we know. "The consciousness that the knowing process is a knowing process must be contained within the knowing process itself."[3] All that is true in the theory is this: "if we really see the necessity of a thing, we cannot conceive it otherwise".[4]

It is important to note that Cook Wilson does reject this second theory, because some who have maintained the self-evidence of Euclid's postulates *have* apparently accepted it. Thus Prof. J. W. Young writes, "The self-evident truth which ruled by the Divine Right of the alleged inconceivability of the opposite".[5]

I think that Cook Wilson is right in holding that there is this activity of mind which he calls apprehending, and I also think that the two views which he rejects are false. For example I apprehend, or know, that $2 + 3 = 5$. By this I mean that any two objects together with any three objects form a group of five objects, provided that each object retains its unity (*i.e.* they do not blend like drops of water). I think it is not true to say that I know this proposition because I am so constructed that I cannot think it otherwise, so that if I were differently fashioned I might know that $2 + 3 = 6$; nor is it the case that I know that

[1] pp. 432, 516, 630. [2] p. 424. [3] p. 107.
[4] pp. 424 f. [5] *Encyc. Brit.* (14th ed.), Art. "Geometry".

$2 + 3 = 5$ because I find it inconceivable that $2 + 3$ should be anything else. I simply know it, and I venture to think that we do not need to give any explanation of this fact.

Unfortunately, however, even if agreement were universal that we can and do apprehend in Cook Wilson's sense there is much disagreement about the range of our apprehension. Cook Wilson, for instance, is prepared to claim that he can apprehend spatial relations, logical relations, causal relations, facts about physical objects, and probably facts about the past. I need hardly say that not everyone will claim so extended a range. In particular, and this is the point of importance for geometry, there are many who will assert that they are unable to apprehend the truth of Euclid's fifth postulate.[1] This in itself does not exclude Cook Wilson's being able to apprehend it; nor does it entail that they can doubt the postulate.[2] But since it does not exclude the falsity of the postulate it makes one who agrees with Cook Wilson on this point, as I do, feel uneasy. One would like there to be a uniformity of knowing-power in such straightforward non-mystical matters. How then shall we deal with such agnostics? I cannot see that we can do anything except to try to remove, as the moral intuitionist does, whatever confusions or prejudices (we think) prevent them from apprehending the truth of the disputed proposition. If, in the long run, some remain still obdurate, I do not think any *logical* crux arises, so long as they do not claim to know either that the postulate is untrue, or that it cannot be known to be true. Cook Wilson does, indeed, admit that there are mathematicians who will deny the self-evidence of his postulate; but, he says, they thereby involve themselves in contradiction, for many of the propositions of mathematics held to be self-evident are "far less self-evident" than this. He gives as an example the "fundamental principle of the application of differential calculus to the treatment of curves".[3] He may be right in this objection, and if this principle be less self-evident than his postulate he has produced a reasonable *argumentum ad hominem*. I do not intend, however, to argue

[1] *Cf.* Dr. Ewing: "It is now generally admitted to be impossible to know *a priori* that space is Euclidean", *A Short Commentary on Kant's Critique of Pure Reason*, p. 41.

[2] If I apprehend that A is B, I can't doubt whether A is B, but if I do not apprehend that A is B, it does not follow that I am able to doubt whether A is B. It is, of course, also the case that if I can't doubt whether A is B it does not follow that I do apprehend that A is B. This latter case may represent the mental attitude of many people towards Euclid's postulate. They are neither able to doubt it, nor to see that it is true.

[3] p. 562.

this point, partly because I feel uneasy about "degrees of self-evidence", and partly because it is unlikely that an *argumentum ad mathematicos* will enlighten those who are blind to the truth of the postulate. Nor, again, will it avail much to argue, as he does, that since hyperbolic geometry contains the proposition that two sides of a triangle are less than the third, *that* geometry is manifestly false.[1] For it seems to me that one who cannot apprehend Euclid's (or Wilson's) postulate might be unable to apprehend the falsity of that proposition also.

My conclusions about this first stage of Cook Wilson's argument are therefore as follows: Cook Wilson has claimed to know that space is Euclidean, but there are many who find themselves unable to make this claim. From the nature of the case, he cannot explain *how* he knows that space is Euclidean, he can only state *that* he knows it, and suggest that others might, after appropriate treatment, come to know it also.

It might naturally be asked at this point why Cook Wilson pins so much importance to his thesis that space is Euclidean, and that the assumptions of non-Euclidean geometry are therefore false. Surely, it may be said, these geometries exist; there are hundreds of volumes about them. What does it matter whether they are true or false of space? To this the answer from Cook Wilson's standpoint is plain. Geometry is a body of true propositions about actual space, and therefore if space is Euclidean, these non-Euclidean systems are not geometries at all.

Cook Wilson holds, therefore, that there is a close connexion between geometry and space. He expresses this view otherwise by saying that the figure is indispensable for geometry. The attempt to prove that this is true forms the second stage of his argument, which we shall now consider.

(2) Thesis: the method of advance in geometry is not by syllogistic inference from a collection of first principles, but by the making of geometrical constructions which render possible the apprehension of spatial relations.[2]

The premiss for this thesis is, I believe, his views on universals. In order to show this I shall confine myself to two questions. (*a*) How do we apprehend universals? To this, his answer is that we can discover the nature of a universal only by apprehending its particulars; there is no awareness of universals apart from particulars.[3] (*b*) How are universals related to universal propositions? He answers that "the universal proposition expresses a connexion of universals".[4] We know the truth

[1] p. 562. [2] pp. 454 f. [3] p. 208. [4] p. 188.

of a universal non-enumerative[1] proposition, *All A is B*, only by apprehending, in a particular instance, that the universal A-ness necessitates the universal B-ness. For example, we can know that all trilateral closed figures are triangular, only by observing that trilateralness necessitates triangularity.

Let us see how these views on universals apply to geometry. I shall take Euclid I, 5, "In isosceles triangles the angles at the base are equal to one another". This, according to Cook Wilson, can only be apprehended, *i.e.* known to be true, by drawing a triangle, making a construction and perceiving that the property is true, not of our crude figure, but of a perfect particular, and of all similar perfect particulars. I shall quote three passages in which he states this view. If we omit the figure and perform a "very simple experiment", namely to "take the definitions, postulates, and axioms of Euclid and try to operate upon them with the syllogistic forms, we shall make no discovery at all; we shall not get *one* of Euclid's theorems; we shall get no conclusion whatever worth having".[2] "The process of discovery then is not an analysis of propositions already given us; it does not consist in putting into syllogistic form any given material of premisses. We add to the given material by the constructive acts, through which we apprehend something other than the material, that is, something which that material necessitates. We do this in geometry by constructing new spatial relations the validity of which we see in the act of construction, and thus we apprehend the universal in the particular".[3] . . . "When the construction is found the problem is solved and the proof also is complete; we do not need to add to it a chain of argument such as we find in Euclid, for though we can thus explain to a learner the connexion of the premisses and the validity of the conclusion, the best way is to retrace the process of discovery. . . . The main thought here . . . is due to Kant."[4]

I will make three comments on these passages:—

(i) It is obvious that Cook Wilson's disagreement with Euclid on the nature of geometrical reasoning has no bearing on his adherence to Euclid's assumptions. (His editor points out that he was mistaken in thinking that Euclid developed his geometry syllogistically.[5])

(ii) He holds that the reasoning in geometry is not a process of syllogising. So much the worse for the syllogism, it might be replied, but the syllogism is not the only form of deductive reasoning. There are other forms, and these cover geometrical

[1] In Mr. Joseph's sense: *Introduction to Logic*, p. 177.
[2] p. 455. [3] pp. 455 f. [4] *Ibid.* [5] p. 454 *n.*

reasoning adequately.[1] In answer to this, I should maintain that Cook Wilson obviously meant to include in his attack *all* forms of reasoning by deduction from given assumptions: "the process of discovery is not an analysis of propositions already given us"—mere deduction by itself is sterile. We must have the geometrical particular, the figure, before us. Actually, he does allow that there is a use for the syllogism in geometry, as, for instance, when we combine two theorems syllogistically in order to deduce a third.[2] But he holds that in such a case we cannot be said to *know* the conclusion, for in order to be able to do that we must have the proofs of both theorems from start to finish before us. Otherwise, we only remember that we did apprehend the two theorems, and this is not as satisfactory as apprehending directly.[3] He has a distinction here between complete and incomplete apprehending which I do not find easy to follow, but it would be too much of a digression for us to consider it here.

(iii) Cook Wilson acknowledges a debt to Kant.[4] If I do not misinterpret Kant, he and Cook Wilson appear to agree on at least two points in this connexion: that we do know *a priori* synthetical propositions in geometry, and that geometry advances by making constructions. Cook Wilson would not, however, agree with Kant's account of *how* we know such propositions.[5] We just *know* them, and a *theory* of knowledge is as unfortunate an expression as a *theory* of universals.

The argument for the necessity of the figure, based on his views on universals, comes, therefore, to this: the figure is necessary, for without figures we have no geometrical particulars, and without particulars we can discover no connexions between universals, so that the knowledge of universal propositions which we do possess in geometry would be impossible.

I now conclude my statement of his second thesis and the arguments which he uses to support it. If this thesis is true, that is, if the figure is essential to geometry, and if his first thesis is true, that is, if all the geometrical figures we can draw obey Euclid's propositions, then it would follow that non-Euclidean geometry is impossible. This conclusion is the third stage of his argument.

Before proceeding to criticism I think it will be best to turn aside to discuss another point which Cook Wilson raises, since it

[1] *Cf.* Russell, *Principles*, p. 457. [2] p. 460. [3] p. 461.
[4] p. 456; *cf.* also, p. lxxxviii: "it was reserved for Kant, both a real mathematician and a philosopher, to free our minds from this illusion".
[5] p. 630.

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has a bearing on his second thesis.[1] This point concerns an argument which the supporters of non-Euclidean theories have used to explain how non-Euclidean space and geometry are possible. Cook Wilson attempts to demolish this argument, and he offers what he considers to be the true account of the way in which non-Euclidean geometries are evolved.

The argument of the "non-Euclideans" is as follows: Let us symbolise Euclid's fifth postulate by *A is not B*. Then a piece of non-Euclidean geometry may be typified by the proposition *If A is B, then C is D*. We suggest that the existence of such hypothetical reasoning justifies us in claiming to have conceived that A is B, and that we have therefore a *conception* of a non-Euclidean space, it being a space in which such propositions as *A is B* hold good. Cook Wilson retorts to this argument that even if we did not know that A is *not* B, the above hypothetical reasoning can give us no sufficient reason for thinking we can conceive of A as being B, or of non-Euclidean space.[2]

This retort is intelligible only in the light of the distinction which he has observed between a *definite* and a *problematic* conception.[3] In order to have a *definite* conception of a complex object AB three conditions must be satisfied.[4] We must apprehend (*a*) the elements A and B, (*b*) the fact that they form a unity, (*c*) how they form a unity. These conditions are satisfied in the case of our conception of a *triangle*. We understand the unity of the three sides with the three angles, for we see exactly how the possession of three sides necessitates the possession of three angles. In the case of a *talking canary*, however, to use Cook Wilson's illustration,[5] only the first of the three conditions are satisfied. We apprehend the universals vocality and canaryhood, but fail to see whether they are co-instantiable. We only know that we see nothing in the universals to prevent the combination. Our state of mind is not one of conceiving but of interrogation or wonder. Hence our conception of the talking canary is *problematic*. For all that, although we do not know whether a thing can be a canary and also talk, we have, Cook Wilson observes, the power of seeing what would follow if a canary could talk. For instance, if a canary were to talk it would fetch a handsome price. The fact stated in this hypothetical proposition is inferred from what we know of canaries, vocality and rarity; for an inference, he holds, "is always understood to be from what we have before us, what we are now apprehending".[6]

[1] I have referred to this point already on page 124.
[2] pp. 563-565. [3] Part III, Chap. V.
[4] p. 509. [5] p. 510. [6] p. 429.

But, he maintains, the fact that we can make such an inference does *not* prove that we have conceived of a talking canary, since by hypothesis we are in doubt as to whether such could exist.

This illustration can be applied directly to the non-Euclideans' argument. As we have seen, the reasoning of the non-Euclidean geometries is of the form *If A is B, then C is D* where *A is B* contradicts Euclid's postulate. Now the non-Euclideans do not claim to *know* that A is B; they only fail to perceive that A is not B. Hence their state of mind towards AB ?[1] is just that which one has when entertaining the possibility of a talking canary. They certainly do not possess a *definite* conception of non-Euclidean space.

Moreover, just as we can draw conclusions from the hypothesis *if a canary could talk*, because we know what a canary is and what it is to talk, so here we can draw conclusions from the hypothesis *if A were B*, because we know what A and B are. A, for example, might be the sum of the angles of a triangle, and B the property of being unequal to two right angles. Both of these are notions we derive from the space in which we live, which (Cook Wilson assumes) may be granted to be Euclidean. We perceive that the "Euclidean element A_1 involves A and B involves B_1 by a purely Euclidean method in each case", and we can therefore conclude that if A were B, A_1 would be B_1.[2] This is Cook Wilson's explanation of how deductions from non-Euclidean assumptions are possible. The fact that we can make such deductions no more proves that we have a definite conception of non-Euclidean space, than the fact that we can make deductions from the hypothesis *if a canary could talk* proves that we have a definite conception of a talking canary.[3]

I propose to make a few comments on this argument of Cook Wilson. I think that what he is saying amounts to this: you can't definitely conceive of A–B unless you know that A *is* B. You admit that you don't know that A is B; therefore, you haven't a definite conception of A–B. Whether A is, or can be, B remains a problem for you.

Now it seems to me that Cook Wilson is right in saying that we cannot *definitely* conceive of A–B unless we know that A is B; his argument on this point in Part III, Chap. V, where he maintains that we cannot "manufacture" a definite conception is, I think, quite conclusive. But he appears to imply that a definite conception is the only genuine kind of conception: he calls it the *true* conception,[4] whence, one might infer, a *proble-*

[1] I am using Cook Wilson's symbol for a problematic conception.
[2] p. 566. [3] p. 566. [4] p. 509.

matic conception is not properly a conception at all. I am not sure that he is right in so restricting the application of the term. I think that we have the power of bringing together two elements in thought which we do not know to be combined in reality,[1] and that we may and do speak of such an activity as one of conceiving. Thus I think we should naturally say that we *can* conceive what a talking canary would be like. In fact, it might be held that we can conceive of AB so long as we do not know that the elements A and B are incompatible. If this is a legitimate use of the word "conceive", then it follows that a person who did not know that space is Euclidean might honestly claim to be able to conceive of non-Euclidean space. Certainly, so long as he thinks that it cannot be proved that space is Euclidean, he can maintain that non-Euclidean space is *conceivable*, in the sense in which a round square is *not* conceivable; although he might, perhaps, confess that *he* cannot *conceive* of it.

However, the word "conceive" is used in so many senses (*vide O.E.D.*) that it would be an unprofitable task to decide whether Cook Wilson's, or the one I have suggested, is the commoner usage. In any case the main facts are not disputed: nobody (I think) claims to *know* that space *is* non-Euclidean; Cook Wilson claims to know that it is not.

I return now to his second thesis, which we had temporarily deserted. We must ask whether his account of the method of geometry is valid.

I think we may see the answer to this question the more easily if we contrast again the position of Mr. Russell with that of Cook Wilson. The passages which I have quoted above [2] from Mr. Russell's *Principles* show that his position includes these two theses:—

(i) There is no *a priori* science of actual space.
(ii) Geometry is an exercise in logic.

Cook Wilson's case may be stated as follows:—

(α) He asserts that there is an *a priori* science of actual space.
(β) He allows that the reasoning in geometry can be set out deductively.
(γ) He declares that without a figure no *advance* in geometrical reasoning is possible.

I have already explained that I think Cook Wilson is right in his first assertion and Mr. Russell therefore wrong in his. Again,

[1] Cook Wilson admits that we can do this (p. 278).
[2] p. 122 (of this paper).

(β) is compatible with part, at least, of (ii). The crux is therefore (γ). It is true, Cook Wilson would say, that the reasoning of a geometrical proof may be set out in the form of a deduction when the proof has been discovered, but *how* was it discovered? Surely not by merely combining the premisses and attempting to make deductions from them? You must have the figure.

This view may appear at first sight quite convincing. Take for instance, Euclid I, 32. Suppose that a person does not know the property stated in it, then however hard he may stare at the triangle he will not apprehend that the exterior angle of any triangle is equal to the sum of the interior opposite angles. He may guess that this relation holds; he may believe it on the strength of someone else's statements or because he has measured the angles himself in this particular case. But he does not *know* it. Let him, however, draw a line through the end of the base parallel to the opposite side, and then, if he knows Euclid I, 29, the new fact will, or should, leap to his eye. He is like a man standing beside a stream which he wishes to cross; it is too wide to leap, but give him a stepping-stone—and he is across.

It is, I think, quite clear that when Cook Wilson tells us that no advance in geometry is possible without a construction he does not mean that this is the only way in which geometrical properties could be *suggested*. For all we know, many or most of Euclid's results may have been suggested by some facts empirically observed; for example, the Pythagorean property may have been found to hold in particular cases long before the proof had been given. But the finding of the proof—this is what Cook Wilson holds cannot be done by combining definitions, axioms and postulates, but demands instead a series of constructions and apprehensions.

I must frankly admit that if it is a question as to how from *Euclid's* first principles the proofs of his propositions were discovered originally, or are to be discovered by anyone anew, I cannot see how a figure is to be dispensed with. It is not that there are no gaps or flaws in Euclid's statement of his assumptions; rather is it that his system is so saturated in notions we derive from our perception of spatial extension and order that we must have a figure if we are to begin at all.

But I hope to show that to admit this is not necessarily to admit that no theorems which follow from Euclid's first principles can be discovered without using a construction. Perhaps I may show this best as follows: let us symbolise Euclid's assumptions by P, and his conclusions by Q, so that his geometry may be

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symbolised schematically by P, *therefore* Q. Now it may well be that there is another set of assumptions, say R, such that (i) R and P are compatible, and (ii) Q can be discovered by combination of, and deduction from, the assumptions R without any geometrical construction. If these conditions can be satisfied then I think we shall have shown that we do not always need a figure in order to make advances from geometrical assumptions, although we do need one for Euclid's assumptions. I think that they can be satisfied. I need only refer to Prof. H. F. Baker's *Principles of Geometry*, Vol. I, pp. 4-6. He considers there three kinds of entities, "points", "lines" and "planes", which are any objects satisfying certain primitive propositions, R'. These latter perform the function of our set of assumptions R, for (i), the set of entities which satisfy R' also satisfy Euclid's assumptions P, and (ii), by combination of the propositions R' we can deduce theorems Q which follow from Euclid's assumptions. For example, Prof. Baker deduces that for any pair of *skew* "lines" a transversal exists passing through a given "point" not on either "line". This theorem could be proved with the aid of a figure from Euclidean assumptions, but he deduces it without any figure. (I must mention that the first condition is not quite accurately satisfied by Prof. Baker's system. There are some differences between his system and that of Euclid: for example, his assumptions imply that the "line at infinity" is accessible. But such differences do not, I think, affect the main contention.)

Thus the passage from R' to Q has been made without any construction, and this, it seems to me, refutes Cook Wilson's assertion that without a construction no discovery is possible. I think the same result might be reached by considering the application of algebra to geometry. If this result is valid, then the main premiss of his argument against non-Euclidean geometry has crumbled; and we must admit, unless some other argument be forthcoming, that from propositions assigning non-Euclidean properties to points, lines and planes, theorems in non-Euclidean geometry can be deduced, without any use of a construction.

I can see two objections which might be made to this account of geometrical discovery, and I shall try to deal with them.

(1) It may be asked how we are to know the manner in which the assumptions R are to be combined in order to reach the conclusions Q. To this I should reply that the process must be largely one of trial and error; and if this be held to be unsatisfactory I may point out that it is just the way in which the proper construction is found in solving a geometrical problem with

the aid of a figure. This element of 'randomness' is of course lessened in both cases as we become better geometers. It might take a long time to discover the whole of geometry by a random combination of propositions, but, on the one hand, it need not be *entirely* random, and on the other, we must remember that Euclid's *Elements* was not composed in a day.

(2) It may be objected that even if the discovery of a theorem can be achieved without making a construction, still there must be a reference to space at one or more stages of the argument; and it might be held that Cook Wilson's argument against non-Euclidean geometry would then be tenable, since he holds that we can have no conception of non-Euclidean space. If we apply this objection to our scheme of propositions, P, Q, R, what it seems to come to is this: we must draw or imagine a figure of some kind in order to show that the entities which satisfy the assumptions R also satisfy Euclid's assumptions P, and a reference to space is also necessary if we are to show that our deductions are theorems in geometry. Now it seems to me that if we say that this "reference to space" is all that Cook Wilson meant to insist on, we are diluting the view that he expresses on pages 454-456 very considerably. However, since it is possible that there is an element of exaggeration in his view as there expressed, which would have been removed in a work meant for the public eye, I shall try to deal with the point. I hope to show that it is valid, but that it does not prove the impossibility of non-Euclidean geometry.

Let us consider Mr. Russell's attempt in Chap. XLIV of the *Principles* to show that geometry is an exercise in logic, the reasoning in it being of the form R *implies* Q. Now we can reasonably ask whether such a piece of argument must not satisfy some specific condition in order to deserve the adjective "geometrical". We think, quite rightly I believe, that the assumptions R cannot be just any propositions we please. As well as being consistent they must satisfy some other condition that will distinguish them from the first principles of arithmetic or algebra. Such a condition Mr. Russell is ready to supply, *viz.* "Geometry is the study of series of two or more dimensions".[1] Now it seems to me that if we are to be convinced of the adequacy of this condition one thing that must be shown is that Euclid's geometry is covered by it. In order to show this, I think a reference to space, *i.e.* some construction or series of constructions, will be unavoidable. We may also need some such reference

[1] *Op. cit.*, p. 372.

when we attempt to establish the consistency of the primitive propositions of the system.[1]

But this will hardly help Cook Wilson. For, suppose that a set of propositions R has been shown to be geometrical and to be compatible with Euclid's assumptions, then by taking a new set R' containing one or more of the contradictories of the propositions in R we obtain a non-Euclidean set of geometrical assumptions from which, as before, we can deduce a number of conclusions. But these conclusions are geometrical, and that they are non-Euclidean can hardly be disputed; yet no non-Euclidean figure need be employed.

Even if this objection had assisted Cook Wilson there are two further considerations which, I venture to think, put out of court once and for all his attempt to refute non-Euclidean geometry. First, he does himself admit that hypothetical reasoning of the form *if p then q* is possible where p is a non-Euclidean proposition; and this is all that the non-Euclidean geometer requires, for such hypothetical reasoning is what he *means* by non-Euclidean geometry. It may be (Cook Wilson maintains that it is) the case that p is a false proposition, but in the first place, this is not relevant to its geometrical character, and in the second, p is not asserted; it is used merely as a hypothesis.

The second consideration is this: the non-Euclidean geometer *can* and *does* employ constructions to illustrate his propositions and help him to notice the implications of his assumptions. I think any book on non-Euclidean geometry will give examples of this method.[2] We must exercise a "willing suspension of disbelief" if we are to regard lines and planes as behaving in the way the assumptions demand, but that it can be done is manifest.

I shall now sum up the conclusions I have reached on Cook Wilson's argument:—

(1) He claimed to know that space is Euclidean. While I think that this claim is just, I also observe that it is one which many people find they cannot make.

(2) He has maintained that no conception of non-Euclidean space is possible. I think he is right if the word "conception" be used in his strict sense, but there *is* a usage of the word in

[1] *Cf.* Prof. Paton's remark: "it is just this finding of objects, and of a system of objects, which Kant would consider to require the intuitional element necessary both to the truth and to the consistency of mathematics, and totally lacking in the metaphysics he set out to criticise", *Kant's Metaphysic of Experience*, Vol. I, p. 157.

[2] *Cf.* D. M. Y. Sommerville, *The Elements of Non-Euclidean Geometry*, pp. 30 *seqq.*

which one who did not perceive that space is Euclidean might be said to conceive of non-Euclidean space.

(3) I have argued that Cook Wilson is right as against Mr. Russell in holding that there is an *a priori* science of actual space to which the name geometry has usually been, and still may be, given. On the other hand, the term is now often applied to a science which proceeds deductively from geometrical assumptions. I have urged that the figure is not necessary for the making of deductions in such a science, and that even if it were, this would not dispose of non-Euclidean geometry, since it is possible to draw figures to illustrate and aid the reasoning from non-Euclidean assumptions.

Although I venture to think, therefore, that Cook Wilson's attempt to dispose of non-Euclidean geometry is not successful, his criticism of loose thinking and speaking about non-Euclidean space is of much value. In this respect his polemic resembles that waged in the *Analyst* against the abuses of fluxions. But it probably reflects the more parochial nature of the sciences to-day that no mathematician seems to have replied to Cook Wilson's arguments; his strictures would hardly have gone unnoticed in the days of Berkeley and Newton.

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III.—AMBIGUITY.

By Richard Robinson.

There is a certain early stage of human beliefs and assumptions about ambiguity which may conveniently be called the naïve stage. A man who is in this stage habitually assumes that the same word means the same thing every time it is used. He is therefore not in the habit of distinguishing various meanings of the words he uses. He will say that a thing is 'good in one way but not in another'; but he will not say that it is 'good in one sense of *good* but not in another'. He will distinguish kinds of goodness, but not senses of the word *good*. He will be aware of a few gross ambiguities, such as bank = seat and bank = the turning of an airplane, and he will be capable of using them to make puns; but they will appear to him as isolated freaks or accidents, of no serious importance either in the search for truth or in the effort to convey ideas. He has no fear of being deceived by such a phenomenon, and uses all his words with unquestioning confidence that each one of them means the same thing every time it is used.

The early and middle dialogues of Plato provide an illustration of these naïve assumptions about ambiguity. The early dialogues frequently represent Socrates as seeking for definitions of terms. Now, before we seek to define a term we should make sure that it has only one sense, or at least which of its senses we are trying to define. But Socrates never does this in the Platonic dialogues. In every case he puts the question and proceeds to look for an answer with the most perfect confidence that the word means the same thing every time it is used. 'Since you call all these things by one name, and say that although they are opposite to one another each of them is figure, what is this "figure", as you call it, that belongs as much to the curved as to the straight?' (*Meno*, 74D). In rejecting proposed definitions his procedure is often to produce a case of the definiendum that fails to come under the definiens, or contrariwise. Such a refutation is perfectly satisfactory to him because he does not realise that, if a term has two senses, a case of one of its senses naturally would not fall under a definition of the other sense.

Only once in the early dialogues is there anything near a suggestion that the definiendum is ambiguous. The idea that perhaps virtue is *not* the same in all virtuous persons is made to come from the somewhat stupid Meno; Socrates takes only a page to refute this, and is evidently perfectly confident of its untenability (*Meno*, 72-73). The essence of the Socratic search for definitions is precisely the insistence that the word *must* mean the same in all its uses, however various they at first sight appear.

The theory of Ideas, as set forth in Plato's middle dialogues, rests on the same naïve assumption about language. 'We are accustomed to assume that there is some one Idea related to each collection of things to which we give the same name' (*Rp.* 596A). To each name there corresponds an Idea—and only *one* Idea, however various the uses of the name may appear to be.

Not that these dialogues are perfectly unconscious of ambiguity. In the *Euthydemus* Plato first depicts and then exposes at considerable length some fallacious arguments resting on the ambiguity of the word *μανθάνειν*. But he thereupon dismisses all such matters as puerile. 'Even if a man knew many such things, or all there are, he would not thereby know anything more about reality; he would merely be able to play jokes on men by means of the difference of words, tripping them up and overturning them, like those who pull the chairs away from persons about to sit down and rejoice to see them fall over backwards' (*Euths.* 278B). This profound contempt for the jugglers of language, and this serene confidence that their art can have nothing to do with the serious business of science, are dominant in Plato's early dialogues; and they are characteristic of the naïve stage of human beliefs about ambiguity.

That these naïve beliefs are false is easy to realise in this age of many-volume dictionaries. The Oxford English Dictionary assigns more than one sense to practically every word in the language. Ambiguity is not a rare freak; it permeates language as much as water permeates an organism. Let us review some of its forms.

First we may notice those 'singular' terms which ambiguously denote more than one particular or singular. One class of these includes 'this', 'now', 'he'. Such words have a different meaning practically every time they are used; but they are usually intelligible because there is a rule by which we can tell in any case which particular is being denoted then. Another and a stranger class of singular terms are the proper names, which appear to denote different particulars ambiguously without any rule to determine which is being denoted at any given time.

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The hearer just has to divine from the whole situation which of several persons is now being meant by the word 'John'.

Passing from singular to general words, we may note first that kind of ambiguity which Locke describes neatly, though he perhaps regards it as explaining more of our speech than it does. A general word to Locke is a man's arbitrary name for an arbitrary collection of simple ideas, and men vary slightly as to what they put into the collection. The set of simple ideas which one man collects under the word 'animal' is not quite the same as his neighbour's; and hence arises ambiguity between the two of them. To Locke, perhaps, no word is ambiguous to a single person, but every general word is ambiguous in the mouths of more than one person.

Then comes what may be called 'sliding ambiguity', the ambiguity of the term that covers a wide area and refers now to a larger and now to a smaller part of it. Such a term embraces a big complex of conceptions, put together under one word because we feel them to be somehow connected, or because we have not clearly distinguished them; and it has varying uses in which varying parts and selections of the complex are intended and omitted. Our common moral terms are of this order. 'Virtue' slides from monogamy to all moral desiderata; and the Greek 'arete' slides on to all the desiderata of character and intellect and body. The word 'calon' covers a complex including most of what can be covered by our words beautiful and noble and honourable. The account in the *Symposium* of the lover's progress towards the absolutely 'calon' gives representative samples of its field. In the *Gorgias* Socrates' more formal proofs of his important positive theses are all based on the ambiguity of this word or the corresponding ambiguity of its opposite 'aeschron'. For example, his proof that doing injustice is worse (than suffering it) consists in inferring it from the three premises, first, that doing injustice is more 'aeschron'; second, that the more 'aeschron' is either the more painful or the worse or both; and, third, that doing injustice is not more painful. The first premise, that doing injustice is more 'aeschron', takes a part of 'aeschron' roughly corresponding to our word shameful; but the second, that the more 'aeschron' is either the more painful or the worse or both, consists in explicitly taking other parts of the complex that can be covered by the word. The words 'good' and 'agathon' are ambiguous to much the same degree and in much the same way as 'calon'. They are always deceiving us, especially by sliding from the object of desire to the morally good or contrariwise. The *Gorgias* (506D) provides a very

neat example of this particular shift in a short space. Having been speaking of the 'agathon' in the sense of the object of desire, Socrates says: 'and the agathon is that by whose presence we are agathoi?'

Our last and most important kind of ambiguity is 'relational univocity'. The phrase 'relational univocity' is used here to summarise the following doctrine of Aristotle's:—

> The word 'being' has many senses, but they are all related to one thing, to some one nature. The word is not ambiguous, but is like the word 'healthy'. Everything 'healthy' is related to health, sometimes as preserving health, sometimes as causing it, sometimes as indicating it, sometimes as being capable of exemplifying it. *Metaph. Γ.* 2, 1003a33.

There is no genus identical in healthy exercise and healthy complexion and healthy roses. The word is used to indicate now this and now that relation to health. Exercise *causes* health; complexion *indicates* health; roses *possess* health. What particular relation to health is meant in each particular case has to be learned from the context. By the 'context' is here meant both the rest of the utterance, and the circumstances in which it is uttered, and all the knowledge possessed by the speaker and the hearer so far as it is relevant. The alcohol in a thermometer is fixed in position at bottom and sides, but moves upwards and downwards under the influence of temperature, thus signifying something to us. Similarly, the word 'healthy' is attached in our minds to some one notion of health, but moves in other dimensions (the various relations of health) as influenced thereto by each context, thus signifying on each occasion some relation of health to us. 'Relational univocity' is a bond that holds together the various meanings of an ambiguous word; and its mechanism is the varying force of the context and the fixed force of the term in relation, together acting on the word as the moving force of the pistons and the fixed force of the bearings together act upon a crankshaft. It is immensely common; practically every descriptive word has distinct meanings so related.

This review of a few common kinds of ambiguity is sufficient to show the falsity of the naïve assumption that most words have only one meaning. At any rate, when words are considered singly and separately, and not in some sentence or other, the truth is that ambiguity is the rule and not the exception. It is therefore wrong to assume a single Form or universal corresponding to each word, and wrong to seek a definition of a word without

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making clear, by the context or otherwise, which of its senses is to be defined.

The question arises why there is all this ambiguity in language. Could we deduce the necessity of ambiguity from the nature of reality in general, or of our thinking in particular, or of symbols? This question no doubt requires criticising; it may assume some falsehood. Perhaps it is impossible to describe first the manner of our apprehension of reality and thereafter the manner of our symbolisation of it, because our apprehension is conditioned by our symbolisation and exists only in and through it, so that language is not subsequent to thought in the way the question implies. Assuming, however, that the question is legitimate, let us ask what suggestions can be made towards an answer.

Aristotle explains the prevalence of ambiguity by saying that, whereas there is no limit to the things we may want to refer to, there is a limit to the symbols at our disposal for referring to them:—

> Since we cannot introduce the realities themselves into our discussions, but have to use words as symbols for them, we suppose that what follows in the words will follow in the realities too, like people reckoning with counters. But it is not the same. For whereas words and the quantity of sentences are limited, realities are unlimited in number. It is therefore inevitable for the same sentence and the one word to mean more than one thing. As, therefore, those who are not good at using counters get deceived by those who understand them, just so in the case of sentences those without experience of the power of words reason fallaciously both when speaking themselves and when listening to others. (*SE* 1, 165a6 ff.)

Aristotle does not explain, here or elsewhere, so far as I know, why the quantity of words and sentences is limited. The attempt to do so would have led him to alter this account considerably. The obvious question is why we do not make more words to fill the gaps. The only answers that present themselves are, first, that neologisms are inelegant, which seems thoroughly inadequate, and, second, that our memory cannot retain so many words. But is our memory then so constructed that it can retain far more things than words? How does it come about that we have in mind more things to be symbolised than we have words to symbolise them? Aristotle seems to be assuming that we first apprehend a reality and afterwards look for a word to symbolise it. But surely our knowledge of insensible things very rarely comes about in that way. Surely the process of apprehension, in so far as it is not bodily sensation, usually occurs in and through the presence to our imagination of appropriate words, not prior thereto. It is only in getting the right words that we come to

know the fact. It is true that our memory for words is limited; but our memory for abstract things is equally limited, because only by means of words can we think of abstract things at all.

The reasons for the ambiguity of language lie elsewhere than this passage of Aristotle's suggests. Some of them are obvious and others are hidden. An obvious one is that people make shifts in the meaning of a word through ignorance. They begin to use a word which they have heard or seen, without consulting the dictionary; and the sense which they have divined from the contexts turns out to be not quite what the authors had in mind. Another obvious cause of ambiguity is that people make shifts in the meaning of a word for a purpose, though not for an analysed and deliberated purpose. They can think of no old word for what they want to say; but they see that in the present context a certain word would, by the principle of relational univocity, be forced to take on the new sense which they require.

There are also three less obvious and more important reasons for the ubiquity of ambiguity. The first is the fact that we have not yet completely discriminated the parts of reality. The growth of our understanding is among other things an increase in our discrimination, by which the big blooming buzzing confusion from which we start is gradually distinguished into its components. Now our words must reflect the extent to which we have carried this process, the extent to which we have detected differences in things. They discriminate what we have discriminated, and confuse what we are still confusing. But, since we shall never have done clearing up confusions, our words will always be concealing differences, and there lies an eternal possibility of ambiguity. Mr. Stuart Chase will therefore be disappointed in his hope that there will one day be a semantic technique 'which will let us take a political speech . . . and tell specifically what is wrong with it',[1] because what is wrong with any language always depends in part on what the facts are, and we shall never have done ascertaining what the facts are. The very same sentence in the same context may be ambiguous if reality is this way but univocal if reality is that way. For example, whether '257c' is an ambiguous reference to Plato's writings depends on whether Stephanus, in his edition of Plato, recommenced with page one at the beginning of each volume.

It follows, as Alfred Sidgwick well shows, that every question, however much it seems now to be a question of fact, may turn out some day to be a question of definition, since definition or

[1] *The Tyranny of Words* (New York, 1938), p. 169.

distinction is the cure for an inconvenient ambiguity. To the man of more discrimination it will seem a question of words; but when he says so to the man of less discrimination he will be accused of refusing to answer a plain question. It is a great step forward in the skilful use of language to have realised that no question whatever can be guaranteed to be 'plain'.

The second important reason why ambiguity pervades all language is that all language involves the use of descriptive words, and, as Alfred Sidgwick says, 'it lies in the nature of language that descriptive words shall, as such, be liable to cause ambiguity'.[1] Let us examine the two premises of this argument in turn. That all language involves the use of descriptive words is equivalent to the fact that no sentence can consist purely of proper names and demonstrative symbols like 'him'. At the least there must be one descriptive word, as in 'John hit James'. A descriptive word, which may also be called a connotative word, can be defined, and can apply to more than one situation. With these explanations probably no one will deny that 'all language involves the use of descriptive words'. The second premise is that 'descriptive words as such are liable to cause ambiguity'. Sidgwick justifies this as follows. A descriptive word is a class-name. It collects things into groups where each member is supposed to have the property connoted by the word. But now every class has subclasses; and those subclasses are ignored by the name of the class. Therefore the name is indefinite; it omits specifications which are always present in reality. It is equally applicable to adjacent cases which nevertheless are different. This indefiniteness, this ignoring of real differences, is then an inevitable character of all language; and it is a permanent possibility of ambiguity in a bad sense, since we are never certain that no harm will come of our ignoring the sub-classes.

The third important reason for the prevalence of ambiguity is that ambiguity is so often a good thing. To start at the bottom of the scale, the pun is evidently a form of ambiguity that is reckoned as (within limits!) good. More powerful and therefore more valuable than the pun is the *double entendre*. A superb example of the latter is this of E. M. Forster's: 'The only thing worth giving away is yourself'. Here 'give away' carries the meaning of revealing one's shortcomings, but also the meaning of love, the perfect gift. The compaction of these two ideas into a simple sentence explodes a whole magazine of emotions and reactions—affirmation of love, joy in love, fear of blame, fear of mockery, deprecation of mockery, all in a single phrase. You

[1] *The Use of Words in Reasoning* (London, 1901), p. 228.

do not achieve the same high tension by saying each of these things successively.

Besides ambiguity of statement there is ambiguity of tone, of the manner of the statement. And a special case of this is ambiguity about the value the speaker puts on the fact stated. Does he approve it or disapprove it? Socrates deprecates his own ignorance; but there is at the same time a suggestion that this ignorance is somehow better than the knowledge of the other party. Such equivocation about one's valuations, when not successively asserted but simultaneously implied, is something we often mean by the word irony.

We may be unable to distinguish clearly all the seven types of ambiguity described by William Empson; but he proves convincingly enough that ambiguity plays an enormous part in the effectiveness of poetry. Consider the phrase: 'Zuleika was not strictly beautiful', falling where it does in Max Beerbohm's description of her person. There is no doubt that he is very successfully having it both ways. By disclaiming strict beauty for his heroine, he wins a reputation for judicial gravity and escapes from the class of romantic novelists. And yet he has at the same time, without our knowing it, insinuated into us a conviction that Zuleika was extremely beautiful. The whole description is made by negations and flippancies; but their effect is to drug our critical faculties and make us passionate devotees of Zuleika.

Empson draws the valid conclusion that we often misinterpret a poet's word if we assume that it has only one of the dictionary senses. One learned commentator says the poet meant this and another says he meant that; but he meant both. And the full force of the poem is to be gained not by following one interpreter but by following them all at once, in that synthesis of contraries which gives the poem its intensity and magic. Hence the nothingness of the literary criticism that condemns Shakespeare and Keats because their images conflict.

This principle should be used in interpreting not merely words and sentences, but also images and parables and figures of speech. Every man who writes a parable is so far a poet; and he does not mean his image to have one single precise meaning, with a mathematical one-one correspondence between image and archetype. He seizes on every opportunity for significance that his image presents, even if it was no part of his original purpose in conceiving it. I shall argue in my book on Plato that the figure of the Divided Line in the *Republic* came to have a second meaning to him as he wrote it. The figures of the Sun and the Line and

the Cave are poetry as well as philosophy. It would be fantastic to expect to reduce every element in them to a mathematically precise and logically rigid science, and still more fantastic, though people are always doing it, to expect the Line, if so reduced, to correspond precisely to the Cave.

Plato is both poet and philosopher; and in bringing him forward we have been insinuating a paradoxical proposition which must now be made explicit, namely that ambiguity is often advantageous in philosophy and science as well as in poetry.

One argument in favour of this view, that ambiguity may be valuable in philosophy as well as in poetry, would be the doctrine that all language is both emotive and informative. Helen Wodehouse has persuasively argued, in MIND for 1938, that Richards' distinction between the emotive and the scientific powers of language must be taken as indicating, not two species of language that can exist apart, but two aspects inevitably combined in every speech, though usually one is more prominent than the other. If this be true, as it appears to be, all scientific writing would have its poetic aspect; and therefore might benefit from ambiguity in all the ways in which poetry does.

What is here to be maintained, however, is the view that science receives the greatest benefits from ambiguity, not merely in virtue of the poetic elements inseparable from any scientific statement, but also in its strictly scientific aspect. This begins to appear when we ask how we are to symbolise new things, for which there is as yet no symbol. At first the obvious answer seems to be that we should invent a new symbol; and in this attitude of mind Housman praises the man who invented the word 'gas', an entirely new root to convey an entirely new notion, conveniently brief, conveniently univocal, and submitting moderately well to inflection. We need not deny these advantages; and we need not say this sort of thing should never be done. But we must ask how the inventor of this word got other men to understand what he meant by it. Inevitably he used a definition. And inevitably this definition was composed of old words, whose meanings were already familiar. It seems, therefore, that all the inventor did was to enable us to express in a short word what had previously taken a long phrase. He abbreviated language; a service undoubtedly, but not of the first order of originality. Perhaps, however, he not merely invented the word, but also was the first to bring together into one complex that specific set of ideas which the word conveys. That would be another service, and a greater one. But still it is not first-class originality; because it is only a new combination

of old elements, and contains no new element. Is all our thinking always to be a reshuffling of the same elements, like the processes of nature according to Democritus? A restringing of the old beads, with never a new one added to the collection? But we never get an idea without the words for it; and, if we did, we could not convey it to another without words. Here then is the difficulty; we hope to get a perfectly new idea from time to time; but we can only use the old words with which to get it, or a new one that has to be defined in terms of the old; and the old words only mean the old things. So we are apparently condemned always only to rearrange the old notions. Our original axioms and postulates and definitions have been given to us once and for all (though Heaven knows how); and all we can do is to go on drawing their consequences. No doubt they are tremendously powerful, and there is an inexhaustible supply of theorems to be proved. But if we hanker for something radically different, for something outside the system altogether, some entirely new axiom or definition, we cannot be satisfied.

Irreducible originality is possible through the fact of ambiguity. Great minds on the one hand, and the unconscious folk on the other, hint their new idea, and we divine it from them, by means of an old word in a new sense. The new sense is not given by formal definition, for that could only be a new combination of old ideas. It is given by 'relational univocity', that is, by the reaction of the context with the old sense. A strange context forces the word to take a new sense. The word makes the least shift from its old sense that the context allows, and makes it in the direction dictated by the context. That is how the word 'wood' came to convey the new idea of 'matter' in Aristotle's mind. Do not suppose that the beginning was those quasi-definitions of 'matter' that are to be found in his works; on the contrary, they are crystallisations or deposits of the idea already formed, and could not be understood by one for whom the word 'wood' still meant only the organic tissue.

In mathematics, where we aim at great rigidity in our symbols, we sacrifice adaptability and copiousness for the sake of precision in statement and certainty in intuition and inference. We limit ourselves to a prescribed field for good purposes. But we cannot always limit ourselves. We wish to be able to deal, at some time or other, with anything that may come along; and no definite system of symbols, defined by a set of axioms, can be adequate to deal with any situation that may arise in the future. The more precisely the constitution of a country is defined, the worse it meets unforeseen situations. For dealing with new

situations we must fall back upon the indefinite total of our symbols, which is relatively unorganised, does not clearly distinguish axioms from theorems, and consists mostly of undefined and ambiguous symbols.

This does not mean that first-class originality is non-existent in mathematics, but that it occurs not in the march from axioms to theorems within the system, but in the groping to the system as such from and by means of the mass of ambiguity outside. Nor does mathematics ever reach a stage whence it can proceed without any more use of indefinite symbols. He who effectively renounces indefinite symbols merely adds theorems to an established system. But the discoverers of non-Euclidean geometry, and all such geniuses, did so by daring to wade again into the sea of ambiguity. Mathematicians sometimes say that their science requires no words, no verbal symbols. However this may be, their science, in its most creative moments, does require the use of ambiguous and indefinite symbols, whether verbal or otherwise. The exact part of mathematics will always be surrounded by an umbra of inexactitude.

There is a danger that this doctrine may encourage some of our bad tendencies, may invite us to mistake obscurity for profundity and slipshodness for fertility. Part of our precaution against this danger must be to remember that ambiguity is bad as well as good, and to try to bring before our minds as fully and distinctly as possible the difference between the two. We must balance the advantages of ambiguity against the undoubted need for exact concepts, and try to define the use and abuse of each. We must not let our hard-won habits of exactitude faint and lose courage at the realisation that they are not the whole of virtue. All that can be here undertaken towards this end is a brief examination of what constitutes bad ambiguity.

There are two obvious sorts of bad ambiguity which we can quickly note and pass on. The first occurs when the words a person chooses convey to his hearer a meaning other than he intends. It is possible, for example, that an American who intended to tell an Englishman that there was on the highway a commercial road vehicle driven by internal combustion should choose words which would in fact give to the Englishman the impression that there was on the sidewalk a railroad freightcar. This is because the words ' pavement ' and ' truck ' are used in different ways by the Americans and the English. Ambiguity in this sense, then, is what we also call misunderstanding, giving an impression other than you intended because of a wrong opinion about the effect of your words on your hearer. Special forms of

it occur when your words convey some but not all of what you intended, and when they convey all and more than you intended.

The second obvious sort of bad ambiguity is when my words leave my hearer consciously doubting which of two things I intended. I ask him whether he has seen John lately; and he finds himself thinking of two Johns and wondering which I mean.

Both of these obvious kinds of bad ambiguity involve more than one person. Neither of them can arise between a man and himself, except perhaps when he is reading something he wrote a long time ago. In both of them the speaker may be perfectly clear in his own mind about the facts he is symbolising. His error may lie not at all in a misapprehension about the facts to be symbolised, and wholly in his way of symbolising them. The words he chooses do not have the effect he intends; that is all. He has made an error of expression; for good expression includes conveying to your chosen hearers exactly what you want to convey and nothing else.

Let us turn to that more difficult form of bad ambiguity which does not require more than one person, the error that a man may lead himself into at the same time as he leads others. The following phrase of Miss Stebbing's will give us a start. 'Ambiguity arises when (a person) is led on to extend to one referend what is true only of another, without realizing that a transition has been made.' Ambiguity is here regarded as connected with a mental process that occupies time and is different in its later from its earlier parts. Part of the change involved in this process is concealed from the thinker, to the detriment of his inference. He knows that there has been a transition; but he does not see the whole nature of it, and if he did he would no longer consider it valid. He thinks he is holding fast to some identical referend throughout, whereas in truth he has only an identical symbol which is changing its referend. We can think only through our symbols; and in this sort of erroneous ambiguity we fail to notice that the context of the symbol, changing as our thought proceeds, has altered its reference so much that the only identity between the earlier and the later part of our cogitation is the word.

This ambiguity is an affair of inference, if inference is any process of thinking in which we seem to follow an implication or a necessitation. It occurs when both we suppose that the premises necessitate the conclusion, and the reason for our supposition is the identity of a word in successive parts of our thinking, and also the supposition is mistaken because the word means different things in the two parts.

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This account of bad ambiguity seems at first to deal satisfactorily with such philosophical arguments as we consider erroneous owing to ambiguity. The second part of Plato's *Parmenides*, for example, consists of eight 'hypotheses', of which four consist in affirming every conceivable predicate of a certain subject, and the other four consist in denying every conceivable predicate of a certain subject. The four negative hypotheses appear to obtain their conclusion by means of one of the ambiguities of the word *is*. One use of this multivocal term is to mean identity, as when I say that Alfred Sidgwick is not Henry Sidgwick. Another is to mean attribution, as when I say that Alfred Sidgwick is not tall. Now the *Parmenides* seems to obtain its negative conclusions, that X is neither A nor B nor C nor anything else, which are denials of attribution, by shifting from premises which were denials of identity. The proposition that 'X is not A' is taken in the premise in the acceptable sense that Xness and Aness are not identical; but in the conclusion it is taken in the unacceptable sense that X does not have the property A. That is an example of the way in which our account of erroneous ambiguity seems to cover these philosophical mistakes.

But, on second thoughts, even if it *covers* them, it surely does not *fit* them. For surely this ambiguity in transition presupposes an ambiguity without transition, an ambiguity in statement as opposed to inference. If a man can start with the relation of identity but end with that of attribution, and not realise that he has made a shift, surely that must be because, at the very time when he is thinking of identity without transition, he does not distinguish it from attribution. He means ambiguously both in the single statement as well as in the inference.

Let us try, therefore, to define this more fundamental kind of bad equivocity which occurs in the statement even apart from transition. It will not do merely to follow the dictionary and say that it consists in a statement's having more than one meaning. Every statement has more than one meaning, or may turn out to have. Can we then say that it consists in failing to distinguish these separate meanings, that, for example, the argument in the negative hypotheses of the *Parmenides* misleads us because we fail to distinguish non-identity from non-attribution? No; because, though it may be true that all bad equivocity involves a failure to distinguish, the converse is false. The proposition that all men are mortal is not bad for failing to distinguish between Chinese and Japanese. On the contrary, it is essential to every statement to overlook certain distinctions.

Narrowing the proposed definition still further, let us say that

ambiguity is failing to distinguish the two senses *although they are incompatible*. Every statement, we shall now say, has more than one meaning; but this is a defect only when these meanings conflict among themselves. The formula, however, seems still too broad; for we have found that the inconsistency of the meanings may be intended and enjoyed, as in 'Zuleika was not strictly beautiful'. Let us narrow it to this: 'meaning two inconsistent assertions without seeing that they are inconsistent'. But the *Parmenides* shows that this will not do either. There the ambiguity is that the sentence means both the non-identity of A with B and the non-attributableness of B to A. But these two are not incompatible; they could both hold at once between a pair of conceptions. This example compels us to strike all reference to inconsistency from our definition.

Shall we just say that bad ambiguity is 'dangerous indistinction', the case where our inevitable failure to distinguish all the senses brings us to grief, differing in no definable way from other indistinctions except that it does bring us to grief? That seems safe but hardly dashing. An unkind critic might say that it was abandoning the quest. We were attempting to separate from the general mass of ambiguity, much of which is good, a special sort which is always bad; and now we are in effect defining this bad ambiguity as just bad ambiguity. Yet this seems to be the line taken by Alfred Sidgwick in his brilliant discussions of ambiguity. He says that ambiguity is 'important vagueness, and . . . vagueness consists in the absence of a needed distinction between subclasses of X'.[1] In what sense can the vagueness be 'important' except that it leads you into error; and why was the distinction 'needed' except to avoid an error? The whole trend of Sidgwick's discussion is to establish with very great probability that you can give no definition of bad ambiguity except just this circularity that it is the ambiguity which is bad. The reason is this. Our ambiguous statements and our adequate statements are not the records of distinct species of thought. It is, or can be, the same process of human thinking in the statements that we consider excellent and in those we call fallaciously ambiguous. In our best as well as in our worst cogitations we are failing to discriminate some of the elements of reality. Sometimes this indiscrimination leads to a mistake, and sometimes it does not. But the conditions under which it leads to a mistake are not to be found in the mere indiscrimination itself; they lie in nothing less than our whole funded knowledge, our whole

[1] *The Application of Logic* (London, 1910), p. 129.

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present purpose, our whole present situation, and the whole nature of reality so far as it is relevant.

This is the main conclusion of the matter. The search for the nature of the defect in 'ambiguous' arguments ends with the discovery that it is a defect in all our thinking as such; that what we assumed to be a special and isolated phenomenon was really only the painful consequence of an ever-present defect. The ignorant man, when his toothache is still, may say and believe that his tooth is all right now; but the informed man knows that his tooth is as much decayed as it was before; only, owing to the total configuration, undesired consequences have for a time ceased to occur. Occasionally, however, bad ambiguity includes more particular defects, special and eradicable errors; and we may end by examining two of these.

In the first place, when we blame a sentence for ambiguity we occasionally mean that it implies 'an identity which is not there', or, possibly, 'a resemblance which is not there'. Thus Hegel's *aufgehoben* suggests that there is something common to cancellation and conservation, whereas there is nothing common to them, or at least nothing of the sort he suggests. And Parmenides' juggling of the verb 'to be' may be taken as the false suggestion that identity and attribution are species of some genus narrower than the category of relation itself. A first objection to this proposal would run thus: 'Suppose a man to assert that sharks and dogs are identical in being cold-blooded. Now there is no such identity. Yet we should never say on this account that his statement was ambiguous. We should simply call it mistaken.' This difficulty can be overcome by distinguishing explicit assertion from implication or assumption. We shall say that ambiguity is not the explicit and self-conscious assertion, but the unquestioned and unnoticed assumption, of a certain identity which happens not to exist. It is the assumption of a non-existent genus, the taking of two things as fellow species when they are not. This definition seems to be a fairly satisfying description of some ambiguities.

The other special form of bad ambiguity is confusion. The confusion of differents is something other than the failure to distinguish differents. It is not just taking two things as one in some way in which they are not one. It may be taking a pair of Xs not as one pair of Xs but as one X, as when I take Henry and Alfred Sidgwick not for a pair of Sidgwicks but for one Sidgwick. Or it may be taking a pair of species not as one genus but as one species; I confuse identity and attribution if I take them, not as one pair of relations either of which might hold

between a given subject and predicate, but as one single species of relation possessing in some mysterious way the nature both of identity and of attribution. It is possible, apparently, to be thinking of two distinct things as one thing, to think of a couple as a single having the qualities of each of the couple; and that is confusion. The strangest thing about it is that it seems in some sense to presuppose distinction. To confuse identity with attribution is not just never to have heard of their difference. On the contrary, it seems to entail that you somehow appreciate the real character of identity and the real character of attribution. Otherwise you are no more confusing them than when you talk about relations between subjects and predicates in general. But these their real specific characters are just what make them distinct! So that in confusing you are also distinguishing them. How this can be is not clear; but it really occurs and really receives the title of ambiguity.

We set out in this last section to seek a kind of bad ambiguity that was found only in some language and not in all. Such are confusion and the signification of an identity which is not there. But our more important conclusion has been that the cases which we commonly call ambiguous differ from other cases of language only in that we feel that our symbols have failed. The root cause of the failure, so far as it lies in the symbols themselves, is equally present in them all. We can never finally determine whether our arguments are ambiguous or not; the problem always remains open, and only an approximative frame of mind is rational. Whether an argument is ambiguous depends on what the facts are; and our only way of knowing what the facts are is by argument and words; and the best we can do with that vicious circle is to make it a spiral. We can never make it a straight line.

IV.—CRITICAL NOTICES.

Hume's Theory of the External World. By H. H. Price. Oxford: Clarendon Press, 1940. Pp. 231. 15s.

This work is in ingenuity, subtlety and lucidity well worthy of the author, and its appearance will be greatly welcomed by the philosophical world. It might have been thought that his first work on *Perception* would have exhausted the contribution that one man could make to the subject, but a new and most valuable addition to the theory of perception is here provided. For the book is not primarily historical or expository: while it provides valuable help towards the understanding of Hume, it aims mainly not at explaining what he meant but at presenting doctrines of the type maintained by him in a new form which will be better able to withstand criticism. It may be doubted whether it would not have been a better policy to separate sharply the exegetical and the constructive part, indeed my chief complaint against the book is that the method adopted causes it to some extent to fall between two stools, giving in the main an account not of what Hume meant nor of Price's own views, but of something in between the two; but, however that may be, it is certain that the views suggested, even where they are neither Hume's nor Price's own, are very well worth consideration. In my opinion the author develops a powerful argument for a form of realism, but shrinks from working it out to the full because he thinks it would have been abhorrent to Hume. But I do not know how far it is a reviewer's business to quarrel with an author for choosing the type of subject he did choose, provided he has handled it well. I should add that, despite his very sympathetic attitude to Hume, Price makes no attempt to gloss over his defects.

The book opens with an appeal for a more charitable treatment of Hume analagous to the treatment sympathetic commentators have given to Kant, except that there is, thank goodness!, no suggestion of a "patchwork theory" of Hume. This is followed by an excellent but very brief summary of what the author takes to be the main defects in Hume's theory of knowledge (pp. 4-9). But as a whole the book confines itself rigorously to the question of the external world and does not wander far afield. It has therefore to deal with little more than a single long section of Hume. The discussion of the subject opens with a doubtful question of interpretation which is of vital importance to Price's whole attitude to Hume. As is well known, the latter begins his section on *Scepticism with regard to the Senses* by asserting that we cannot doubt the existence

of body. Price is unwilling to take this statement at its face value, because Hume says elsewhere that he does doubt it for short periods when engaged in philosophical study, and because Hume's discussion at least implies that the doubt is not meaningless (pp. 11-12). Price consequently assumes that Hume cannot have been a realist about the physical world, and cannot have accepted the existence of unsensed sensibilia, the only form of realism which he regarded as intelligible, but I do not see any objection to taking Hume at his word. He was presumably referring to continued doubt when engaged in practical matters, not to temporary theoretical doubt in a philosophical discussion, and we surely need not hold that he thought the doubt meaningless—quite the contrary—, only that he thought it psychologically impossible. This he might well find out by trying to doubt persistently and failing in the attempt. Of course, if Hume was a realist we must add that he was a realist of a very peculiar kind, for he admitted that the belief in realism which he held was quite ungrounded; but he thought that our fundamental beliefs were not based, and could not be based, on reason at all. His attitude to body seems to me to have been like his attitude to causation, of which he says: "I have never defended the absurd proposition that a thing could come into being without a cause: all I maintained was only that our certainty of the falsehood of this proposition arises neither from intuition nor demonstration, but from another source", *i.e.* imagination. Price's tentative interpretation of Hume here as meaning that, while we can sensibly doubt the existence of any particular sort of body, we cannot doubt whether any bodies exist at all, seems to me an anachronism inspired by his modern disciples, for which there is no warrant to be found in Hume.

Hume's question as to what causes induce us to believe in the existence of body also raises difficulties because any causal explanation presupposes the reality of causation and the reality of the self, belief in which is just as much open to criticism according to Hume as the belief in body. Price, however, thinks that the question Hume really had in mind was one of analysis, not of causation, *i.e.* "given what characteristics of sense-impressions do we assert material-object propositions" (pp. 14-15). On this my comment would be (*a*) that on the regularity theory of causation usually attributed to Hume it would be hard to see any difference between the two questions mentioned, (*b*) that Hume believed selves and causation to be realities just as he believed bodies to be so, though in all three cases he admits that he cannot justify the belief which he holds. Price then makes the interesting suggestion that Hume's difficulties might have been met by a distinction between the empirical and the transcendental imagination, and goes so far as to say that "Hume is in substantial agreement with Kant about the activity of the Transcendental Imagination" (p. 16). He also finds in Hume an anticipation of Kant's ideas of reason (p. 59).

As is well known, Hume's explanation of our belief in physical

bodies is in terms of " constancy " and " coherence ". Price thinks that the two criteria can be brought under one heading by reference to the single characteristic of " gap-indifference " in series, a gap-indifferent series being a series of impressions such that the occurrence of a gap in any part of it does not prevent the other parts from occurring as usual, whether they are similar (as in the case of " constancy ") or different (as in the case of " coherence ") (pp. 60 ff.). It is an example of a case of " constancy " when on returning to a room we see again an object which was there when we left and a case of " coherence " when we observe that after a certain lapse of time fires go out whether we have observed the intermediate stages or not, but in both cases the essential point is that diversions of our attention have not affected our subsequent sense-data. The characteristic of " gap-indifference " Price thinks of supreme importance in the theory of perception. Though it is nothing more than a contingent fact that our experience should have this characteristic, it is, he thinks, a fact in the absence of which we should have had no consciousness of the physical world. It is this " fragmentary resemblance to a certain standard continuous series " which leads us to posit the continuance of objects unperceived, thus completing the series (p. 62). The difficulty I feel about this account is that it is hard to see how we could have arrived at such a notion without sometimes encountering series in which all the gaps were filled, yet, as Price admits, we rarely, if ever, observe an object or a process of change for very long without the least interruption. There always occurs a momentary wandering of attention or a blink. And it might perhaps be doubted whether without presupposing the existence of physical objects we should be conscious of the gaps as something requiring to be filled in. We should in that case still be aware that our sense-data repeated themselves regularly and should look for causes of the repetition, which search might eventually lead us to postulate physical objects, but we should presumably not, except on the strength of such indirect arguments, regard the intervals during which we had different perceptions as gaps in the observation of something persistent, whether it was conceived as having the persistence of a substance or of a series. We ought to distinguish the gap theory as an explanation of the origin of our belief in physical objects and as a philosophical argument for realism. In the former capacity, though it describes the most important factor in the formation of our ideas of physical objects in detail, it requires to be supplemented by the recognition that in the absence of evidence to the contrary we always assume that what we perceive exists in space independently of our perceiving it, and therefore that it continues unaffected when we are not perceiving it unless there is special reason to suspect the contrary. We do not refrain from asserting the independent existence of what we perceive except where we have positive evidence for it; on the contrary, we always naturally believe in such existence

except where there is what we take to be definite evidence against it. I do not suppose that Price ignores this point, but I think he should have introduced it explicitly into his account. Even common sense is unable to keep this belief in the independence of perceived objects in all cases, but it surrenders it only when practically forced to do so, while Price's account seems rather, perhaps unintentionally, to suggest that to assume existents independent of us in space is a step we take beyond our perceptions only in certain cases, on the strength of a kind of analogy, and not something we regard as given in the very act of perception till corrected by the difficulties about illusion. The fragmentary character of our perceptions when taken apart from physical objects or unsensed sensibilia may remain a powerful argument for some kind of realism, and we must thank Price not only for his suggestion of this argument, but for his skilful amendment of Hume's very unplausible theory of the origin of our belief in physical objects, and perhaps chiefly for his analysis of a very important characteristic of our sense-experience, "gap-indifference", which Hume had in mind but which before Price had probably never been analysed adequately.

Consideration of the above-mentioned property of series of perceptions suggests the view of physical objects as series of unsensed sensibilia similar to those that would be sensed if an observer were to observe them but not dependent on the mind (pp. 126-134). This type of view was defended by the present reviewer in his book *Idealism*, and the argument suggested by Price's consideration of "gap-indifference" and the fragmentary character of series of sensed sense-data might well be used in its support. But Price is convinced that Hume was not a realist but thought such a suggestion meaningless, and therefore without letting us know his own views turns from this realist solution to a discussion of two other views which he thinks might have been more palatable to Hume. I have already expressed doubt as to whether Hume was not a realist, but of course it must be admitted that he would have maintained that there could be no good arguments for such a view even if it was the view he in fact held when not engaged in philosophical thought. Further, he definitely prefers the view that the same entities which we sense exist independently of us to the view that our sense-data are like independently existing unsensed sensibilia, which Price himself evidently considers much more plausible. Price does not make it perfectly clear whether he wishes, with Russell, to include in the physical object approximate facsimiles of all the sensible shapes sensed from different points or, with myself, merely those which we should sense from what we usually regard as an optimal point of view under optimal conditions. I also cannot help thinking that in his account of the reasons why Hume did not hold a realist view Price is unjustifiably reading into him the doctrines of modern empiricist philosophers. Price says that the hypothesis of physical objects thus understood would be by

definition unverifiable, and that therefore Hume would hold it to be meaningless, but I cannot find that Hume ever put forward the verification theory of meaning. He held that all our ideas must be derived from impressions, and he confused ideas and images, but might we still not have an image of something that we could never sense, provided it was like what we could sense ?

The remainder of the book is devoted to working out the two theories which Price thinks would be more palatable to Hume than the theory of unsensed sensibilia, though, as he admits, neither of them is a theory actually held by Hume, so that this discussion carries us somewhat away from the philosopher under discussion. Therefore, before I consider it, I shall mention a few more points about Price's treatment of Hume. Firstly, to mention a minor point, I am very glad that Price has not, like most commentators, disdained to give references in terms of the pages of the cheaper and more handy Everyman edition, and I wish his example would be more generally followed with other authors as well as with Hume. It is a real inconvenience to readers, who cannot all be expected to possess the more extensive and expensive editions of authors, if they cannot look up references without either visiting a library or going through a tedious process of hunting for the passage in their own edition without the guidance of a page number. Page references are also given to the edition of Selby-Bigge. Secondly, I am also glad to see that Price deals cavalierly with the refutation of Hume by reference to his " atomism ", which has long seemed to me cheap in the different and bad sense of the word (p. 73). The fact that our experience is sensibly continuous does not prove that we apprehend necessary connexions in it, and Hume's main difficulty was that he could not see that we ever did the latter, though no doubt exception might also be taken to his theory of the finite divisibility of space and time, which Price does not try to discuss. Thirdly, Price gives an interesting discussion of the question whether Hume's argument is vitiated by the fact that in criticising the belief in physical objects he presupposes propositions about physical objects, and comes to the conclusion that though Hume's statement of the argument requires some amendment it is not fundamentally vitiated by this criticism (pp. 115-123). Fourthly, Price brings out the importance of Hume's theory that physical objects are not substances in the sense in which the word has usually been used by philosophers, but series of particulars. In replying to Hume's argument from double images to show that our objects of sense-perception do not exist unsensed, Price, in contradistinction to his view in *Perception*, argues that there is no fundamental difference between the case of double images and the case of merely perceiving an object to have a quality which it has not, and goes on to suggest that in the case of series of sensible particulars (though not of substances) it is perhaps simply a matter of degree of difference whether we say that something new came into existence or merely that there was a change in quality

(pp. 108-113). But he does not embark on the question—which for Hume was very closely connected with the question as to the existence of physical objects—whether there is any intelligible sense of "substance" which does not make it a series of particulars. Fifthly, it is surely misleading to say, as Price does (p. 162), that Hume claimed to know some physical-object propositions with certainty, except in a very unusual sense of "know" and "certainty". No doubt Price is here analysing material-object propositions in terms of the prediction of sense-data, based on inductive evidence, but has not Hume strongly maintained that induction can never give certainty?

Price now proceeds to state and discuss the first of the two theories which he thinks might have been acceptable to Hume and would have solved his problem of how to distinguish between legitimate and illegitimate assertions about physical objects. It is obvious that Hume had found no answer to this problem which satisfied himself, and also that it is an urgent problem for any form of phenomenalism. It is also a problem to which phenomenalists and idealists have often not paid sufficient attention, while, incidentally, it was the problem the answer to which constituted Kant's proof of the categories. It therefore certainly requires discussion, though whether it would not have been better to discuss it in a book on perception with references to Hume than to add it to a book on Hume might be questioned. However, I suppose Price's modesty would have hardly permitted him to write two books devoted to his own theory of perception. The "As If Theory", which Price takes first, in its more usual form asserts that a physical-object proposition is true when certain sense-impressions are as if a physical object existed, though the latter does not in fact exist. Price thinks that this is what was really meant by idealist philosophers who asserted that common-sense propositions were "true at a certain level" but "ultimately false", or "phenomenally true" but "metaphysically false". Now if we analyse physical objects in terms of unsensed sensibilia, but deny the existence of such things, we can still say that the situation may be as if such things existed though they do not really exist. This form of the As If Theory, however, Price thinks, is not open to Hume since he held, or at least should have held, the hypothesis of unsensed sensibilia not only to be ungrounded but to be actually meaningless, so that it would be equally meaningless to say that our experience goes on as if there were unsensed sensibilia. It is obviously senseless to ask what would happen to our experience if a statement that has no meaning at all in the ordinary sense of "meaning" were true. So Price has to work out a new form of the theory according to which it may be true that "s is as if p" even where "p" by itself is meaningless. This he can only do by admitting "that the word 'meaningless' is here being used in a technical sense—not to say a hyper-technical one. When it is said that it is meaningless to ask whether families

of sensibilia exist, this is only a way of saying that their existence is unverifiable by definition, since by definition they contain unsensed members " (p. 149). But if this is all that is meant by calling the hypothesis of unsensed sensibilia " meaningless ", why all this fuss ? A few pages earlier Price has said in explanation of Hume's rejection of the doctrine of unsensed sensibilia in its realist form : " The hypothesis of unsensed sensibilia, he would say, is unverifiable by definition, since to verify it one would have to sense them ; and if a hypothesis is unverifiable, not merely *de facto* (owing to human incapacity) but by definition, then it is meaningless to ask whether it is true, and any argument which professes to establish its truth must be irrelevant. In that case his answer to the question ' Are there any unsensed sensibilia ? Do they really exist ? ' must simply be that there is no such question. It is as if one asked, ' How many miles is it to Utopia ? ' when by definition there is no such place " (pp. 134-135). So in this earlier passage it can hardly be doubted that Price was using the word " meaningless " in a quite different sense, something very like its ordinary sense. And it is as used in this sense that the assertion that the hypothesis of unsensed sensibilia is " meaningless " would provide a conclusive reason for the refusal to entertain it. If " meaningless " merely means " unverifiable by definition ", then everybody knows that the hypothesis is meaningless if Price is speaking of direct sensible verification, and, on the other hand, if he is speaking of indirect verification, to reply to the argument that the " gap-indifferent " character of our sense-data makes the hypothesis probable by saying that it is " unverifiable " would be merely to beg the question. The argument just is that this characteristic makes it probable, *i.e.* indirectly verifies it, and therefore the objection that the hypothesis is " meaningless " can only be valid if we have first refuted the argument in question. But perhaps Hume could have avoided the difficulty by saying that, though the phrase " a family of unsensed sensibilia " is meaningful in the ordinary sense, as it must be if we are to use the concept in prediction, the question whether such families *exist* is meaningless.

But in any case the " As If Theory " is no doubt worth while working out on its own merits, especially when the person who works it out is so subtle and thorough as Price. The theory asserts that propositions about unsensed sensibilia, though not themselves true or even in the above-explained technical sense meaningful, can serve as a basis from which to predict future experiences, and a reasonable question to ask is how this is possible. Price replies that it is possible because, if there are *some* sense-impressions which are as if they were constituents of such a family of sensibilia as we are picturing to ourselves when we picture a physical object, there will probably occur subsequently other sense-impressions which will be as if they were constituents of the same family (p. 147). This prediction can be defended as an inductive generalisation, as we have found that our sense-impressions, since they are " gap-indifferent ",

do mostly bear the characteristics that they would bear if they were members of such families, provided, Price admits, the hypothesis of unsensed sensibilia is not regarded as either meaningless in the ordinary sense or as logically impossible (p. 149). Incidentally this qualification would make it impossible both for most verificationists and for most " idealists " consistently to adopt the " As If Theory ", for most verificationists contend that realism is meaningless not only in Price's technical sense but in something very like the ordinary sense of " meaningless " (otherwise the verification principle would be a useless tautology), and most " idealists " contend that realism is logically self-contradictory. This much diminishes its utility as a help to philosophers in distress, but since the most plausible argument against realism is, after all, not that it is logically impossible, but that it is unproved, the theory will remain very valuable for those philosophers who are convinced that the belief in the existence of physical objects in the realist sense cannot be justified but wish to find some other sense in which they can interpret physical-object statements. Further, their failure to interpret physical-object statements satisfactorily because they cannot adopt a theory like the one suggested would be a serious argument against verificationists and some idealists, unless they can produce a better theory, which they have been at any rate very slow in working out.

The theory has also to face such difficulties as that, *e.g.*, when I am not anywhere near the town hall my sense-data are both as if there were a cow entering the town hall and as if a cow were not entering the town hall, and that, if I see a mirage, my sense-data really are at the time as if there existed on the spot the kind of family of sensibilia which we call a pool of water. Price answers very sensibly by admitting degrees of " As-if-ness ". We only ought to say that there is a physical object of a given kind here when the process of testing whether our sense-data are such as would occur if this object (family of sensibilia) were here has gone far enough to satisfy a sensible man (pp. 153-161). Price's development of this and his handling of other difficulties which the theory encounters are very interesting. The As If Theory as worked out by him provides the most plausible non-realist analysis of propositions about physical objects that I have seen, though still open to the difficulties involved in giving a merely hypothetical existence to unsensed objects. I note that Price several times slips into talking of the families of unsensed sensibilia as " existing ", when in fact they do not exist at all according to the theory. A difficulty which Price doubts whether any non-Realistic theory can completely remove is that quite specific statements may be made purporting to be about unperceived objects for the existence of which there is no evidence. On the As If Theory such statements would, at the time they were made, be meaningless, yet later, when evidence is discovered, they may turn out to be true. Price answers that, as originally put forward, they are not of the " *s* is as if *p* " form but of the

slightly more complicated form "if *p* had been checked by actual sense-impressions, *s* would have been decisively as if *p*" (p. 172). He thinks rightly that the As If Theory is more plausible than the better-known "phenomenalist" theory which analyses physical-object propositions in terms of hypothetical sense-data. For, firstly, it keeps closer to the way in which we actually think, since we certainly do find ourselves thinking of these unsensed objects as if they actually existed when we understand a physical-object statement, and do not merely think of hypothetical sensations (pp. 180-183). And, secondly, it avoids the endless complication and regress of 'ifs' with which the phenomenalist theory would be faced if it tried a detailed analysis of physical-object propositions (pp. 183-191). The extent of this complication Price well brings out. I do not know whether, if the book had not been limited in its scope through having selected Hume as its hero, he would or would not have gone on to say that the fact that our experience always proceeds as if there were families of unsensed sensibilia is adequate evidence that there are such things. If he had done this I think he would have been logical. For after all, what better evidence could there be for the truth of any hypothesis than that experience always goes on in detail as if it were true?

The second theory which Price thinks might have been palatable to Hume he calls the *Expressive Theory*. According to this, physical-object sentences are not statements but rules for co-ordinating our experience, which as rules might indeed be useful or useless but could not be true or false (pp. 193-200). Or, if the sentence "there is a material world" does state anything, it only states that there are sense-data to which these rules can be applied (p. 196). This theory again brings one very near realism. For, as Price points out, we can in this way predict only sensibilia, we cannot directly predict what sense-data people will have or co-ordinate the sense-data they do have, for they may not perceive the sensibilia. And we can only pass from the sensibilia to the sense-data by making the assumption that "every actual sensed impression is itself a sensibile", not only in the sense that S could have been sensed but in the sense that "S would have existed even if the sensing of S had not happened" (p. 210). The assumption of actually existing unsensed sensibilia would on the *Expressive Theory* be indeed only a methodological fiction; but its necessity is further brought out by the fact that actual unsupplemented sense-data do not display regularities, for "as soon as we try to formulate any rule about their co-existences or sequences, we find that any drowsy nod will refute it" (p. 213). In consequence we can only arrive at the regularities which enable us to co-ordinate our experiences at all by filling the gaps in our sense-data with unsensed sensibilia. Price puts the theory in its most plausible and least paradoxical form when he says that "according to the Expressive Theory, material-object sentences *are* true or false in the 'Coherence' sense, though in the 'Correspondence'

sense they are neither true nor false" (p. 217). My main comments on Price's account of the two theories are as follows: (1) He seems to ignore in this, as in the rest of the book, the importance of confirmation by other percipients. The empirical feature in our sense-data on which the notion of a physical world depends is surely not "gap-indifference" by itself but gap-indifference together with the presence of similarity between the perceptions of different observers. The physical world is essentially a common world, and if I could find nothing in common between my sense-data and those of other people, the notion of a physical world could hardly have maintained itself, however gap-indifferent my own sense-data were. (2) It does not seem to me that he has clearly made up his mind as to whether the theories are put forward as attempts at analysis of "material-object propositions", or as accounts of the views we ought to hold about them though in fact such views are not held by common sense. (3) If predictions of future sense-data are only made by first predicting unsensed sensibilia and then predicting sense-data from these, surely we must either admit that the prediction is ungrounded or accept on the strength of it not only the belief in the future sense-data but the belief in the unsensed sensibilia also? If we can only infer q from p by first inferring r from p and then inferring q from r, we must surely accept r if we accept q on this evidence, and that would give us realism. I do not know whether it was only the self-set limitation of this book to views that he thinks Hume might have held, or solid philosophical reasons of his own that I have overlooked, which prevented Price drawing the conclusion in question.

In his last, brief chapter Price says that he thinks Hume would have preferred the *Expressive Theory* to the *As If Theory*, and brings out again the connexion between him and Kant on the one hand and the positivists on the other. But surely it is wrong to say that Kant's *a priori* synthetic judgments are rather rules for making judgments than themselves judgments (p. 221). Practically all mathematical judgments are synthetic *a priori* according to Kant, and all empirical judgments, besides being synthetic, have an *a priori* element. If "empirical judgments" are not judgments but rules, what judgments are there? The book concludes with a clear summary of the issue as left by Hume. It is a book which all philosophers will recognise as an admirable contribution to the subject, whether they agree or not with the detailed criticisms which, as reviewer, I conceived it my business to make.

A. C. EWING.

Language and Reality, The Philosophy of Language and the Principles of Symbolism. By WILBUR MARSHALL URBAN. London: George Allen & Unwin Ltd., 1939. Pp. 755. 21s.

THE main theme of this long treatise is that we ought to trust language and the categories of language, as a guide to the nature of reality.

It is to such a confidence, in the past, that we owe the central doctrines of the *Philosophia Perennis*—the orthodox Greek-Christian world-view, involving the acceptance of transcendental substances, Real universals, knowledge by intuition, and the rejection of any materialistic explanation of minds. But in recent times this confidence in the "natural metaphysic of language" has been shaken by those who profess a new technique—logical analysis—and think they can show that language is in many ways very misleading, and that most (if not all) metaphysics is really meaningless nonsense. They themselves may choose to be called Logical Atomists or Logical Positivists, or may repudiate all such titles: in fact they seem to belong to the tradition of Nominalism, Naturalism, Materialism, which has always haunted the *Philosophia Perennis* like a shadow. It is Professor Urban's task to adopt (or seem to adopt) the same lively approach as the Analysts, to discuss all their chief problems about language and communication with the greatest learning and vigour, but to arrive at directly opposed conclusions. He wants to show that even this new road, if faithfully followed, leads us straight to Transcendental Idealism—that it is, indeed, an excellent prolegomenon to philosophy. This spectacular turning of the tables rests considerably upon his doctrine of symbolism: metaphysical propositions are indeed nonsense, as the Analysts say, but only if taken literally; and it is unfortunate that many of the Analysts have been only too literal-minded. If they had been as penetrating in their account of metaphor and poetry as they were in their account of scientific language, they must have realised that there are wide realms of discourse (including much even of science) where literal meanings are unsuitable or impossible, and where symbolism is the means of intelligible communication. Nearly half this book is devoted to the Principles of Symbolism, and their application to Poetry, Religion, Scientific Theory and Metaphysics. In the first half the discussion is about language in general and includes the following topics: the analysis of meaning, Intuitive meaning and Emotive meaning, the invention of new meanings, meaning and verification, the nature of universals, logical and a-logical features of language, empirical and metempirical knowledge, an analysis of the metaphysical presuppositions which alone can make the "miracle of communication" intelligible to us. At every stage rival theories are stated fully and answered triumphantly: in particular those of Russell, Ogden and Richards, Wittgenstein, Ramsey, Carnap, Stebbing, C. I. Lewis, A. J. Ayer, and (a different story) of Bergson and Whitehead. He relies for support largely upon the great German students of language—Cassirer, Erdmann, Husserl, Sapir, Scheler,—and upon his own interpretation of Kant. In what follows I shall confine myself to comment upon a very few of the doctrines of Part I, and upon the General Principles of Symbolism, which introduce Part II. It will appear that, although Prof. Urban seems not fully to understand the new technique of Logical Analysis, he pre-

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serves something of the " new approach " to these problems in his account of symbolism. I hope that I shall be able to introduce the reader to the real foundations of the metaphysical construction of the second part: if (as I believe) these foundations are not sound, his enterprise may still be followed with profit, for the sake of the patient and understanding discussion of many topics treated in a slick or perfunctory style by many " logical " writers on language.

(1) Prof. Urban makes a valiant attempt to view the problems of communication as a whole—to see how thought and even " reality " are built up out of this social relation of talking and listening. This, I think, is in itself necessary and admirable: but, of course, it leads the author into a pretty tangle of questions, some of which are logical (*e.g.* the definition of " implies ") and some of which are psychological (*e.g.* the nature of belief, doubt, certainty, assertion) but most of which can be understood as logical *or* as psychological (*e.g.* Under what conditions is a proposition indubitable? How does knowledge differ from belief? Under what conditions do two sentences have the same meaning?). Most of us are muddled, and busy offering psychological answers to logical questions, and *vice versa.* It seems to me important to recognise that even if every stage of communication can properly be regarded as causally determined by antecedent stages and other events, this does not at all imply that all questions about communication are causal. (See " The Relevance of Psychology to Logic ", *Proceedings* of the Aristotelian Society, Suppl. Vol. XVII, especially page 66.) I suspect that Prof. Urban thinks that this is implied, and that this is one chief reason why he rejects " causal theories of meaning " and of symbolism and of mind. I should certainly agree with him that not all questions can be answered in causal terms, but I feel sure that he would also wish to assert that there are questions about the *genesis* of linguistic meaning that are in principle unanswerable, and I cannot see why this should be so.

(2) " A word intends an object directly, but it always intends a universal indirectly ": this " indirect reference to predicates " is Conceptual Connotation, and it is with this alone that logic deals (p. 142). For logic treats of implications and " only concepts contain any implicit elements " (277). Prof. Urban does not distinguish between the conceptual meaning of a word and the implications of that word in an assertion. But this does not amount to saying that the conceptual meaning of a word is purely " syntactical "—consists in a number of possible transformations or substitutions. (This may be true of some words " of an auxiliary character ", but perhaps these do not mean concepts at all, 423.) For both the original word and all signs substitutable for it stand independently for universals. These universals are connected, and this alone provides a basis and a justification for the linguistic substitutions. The substitutions are made, the implications are drawn, by the help of universal definitions, if the relevant definitions

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happen to have been formulated; if not, by one's feeling for the language and for all the shifts of sense that ordinary discourse involves us in. And always, in asking just what a given statement implies, we are disregarding many aspects of the "meaning" of words. It is precisely this eliminating process that Prof. Urban examines with very well justified care and acuteness. He remarks with some piquancy that the attitude of many students of language is thoroughly provincial: they cannot see beyond the logical ideals of clarity and univocal sense. If this bias is to be overcome, we must take seriously all those ways in which words can be effective or meaningful which are not relevant to their factual implications. Prof. Urban discusses Emotive meanings, but his chief concern is to distinguish from these an Intuitive Connotation (143 to 168, etc.). He chooses his examples from metaphor and from value-propositions. "Life is green: all Theory is grey": in what sense are these words true? The plain conceptual meanings are not intended, for the implications of "Life is green" are not parallel to those of "Grass is green". But the associated emotions and images are certainly a part, at least, of the intended meaning: for in respect of such associations the contrast of green and grey is *like* the contrast of Life and Theory. Prof. Urban insists upon something more, however: both images and emotions are "subjective", and there is here a meaning which is objective and communicable. Images and feelings assist in its intuition but vary independently of it (148, 165, 216, etc.): and it is a meaning which "could be expressed, although less adequately, in abstract conceptual terms".

Now all metaphor depends upon intuitive meaning, and all symbolism upon metaphor: hence the importance of this discussion for Prof. Urban's philosophy of language. But I do not feel convinced of the propriety of this notion of intuited meaning; for if the intuited meanings of "grey" and "green" here could really be expressed in non-metaphoric and non-emotional words, they must surely be meanings with implications which could be expanded in logical analysis and verified in social experience. That is, they must be conceptual, and as such, not exempt from the criticism of formal logic. And I think that, in the case of value-propositions, we can begin at once to delineate the fields of enquiry—Society, Mind, Body—to which those meanings must belong. But if (as I suspect is the case in the words about Life and Theory) the meaning in question is not to be identified with anything expressed in wholly literal terms, then it surely is a matter of associated images, feelings and words. This leaves many problems unsolved: *e.g.*, Are images and feelings communicable? I think they are in some degree, that is, to limited groups whose general way of life is sufficiently similar to the poet's. And, after all, isn't communicability always a matter of degree? It does not seem to me that the case for intuitive connotation is strong enough; and I also feel that Prof. Urban is in danger of using the notion to solve problems that are purely logical,

e.g., the analysis of propositions into terms (149 to 158, 295, etc.), and the analysis of truth-value relations between propositions (344, 652, 674, etc.).

(3) "The central problem of logic is right reasoning" (272): logic is the science of implicational or conceptual meanings; "the entire field of emotive and intuitive meanings" is a-logical in character (277). Logic must provide a criticism of thought in so far as thought involves inference and reasoning. And it is obvious to Prof. Urban that, if this is what we mean by logic, then "symbolic logic or logistic", the "science of pure form", is not logic at all; and if we wish to use the name "symbolic logic", then "our only recourse seems to be to recognize these two meanings of logic" (273). He cites Ramsey and Stebbing in support of this conclusion: but I do not think this will satisfy those who are acquainted with what these logicians have to say on the subject. Surely one gathers from them and from the whole school that symbolic logic is a necessary part of the criticism of thought. What are the grounds of Prof. Urban's contrary decision?

First, that symbolic logic deals with purely substitutional calculi: the signs do not describe anything and their mechanical manipulation is not a process of reasoning about real things. To answer this, I think one must make certain distinctions within symbolic logic. For it commonly includes (*a*) Foundational Logic, or the Theory of Deduction, or the codification of the fundamental principles of deductive inference common to all argument; (*b*) Postulational Technique, which may be (i) invention of calculi to generate languages for specified branches of mathematics or science, or (ii) the invention and comparison of calculi which have no particular connexion with any languages in empirical or mathematical employment; (*c*) Attempts to show that the principles of foundational logic will generate those of pure mathematics, or that the latter can be generated by the same (or in certain important ways similar) processes as suffice for the former.

(3*a*) I think Prof. Urban's exclusion of (*a*) from logic may rest on the belief that the principles of valid reasoning are not, after all, purely formal, and so no code for foundational logic could ever really be complete. Formal principles, he says, lead us to valid inferences "only if they express, in formal fashion, the results of genuine reflective thinking" (316 to 321). Here "genuine reflective thinking" may mean "clear and distinct ideas" which we intuit and which are not formal. He also says (as do many formal logicians) that non-formal elements must be introduced to make such a code intelligible and workable: for besides postulates and definitions, we have to have rules of procedure, canons of sense and nonsense, and these "obviously cannot be expressed in the symbolism itself" (319). Questions of validity and meaning cannot be answered by "acquaintance" or by ordinary "descriptive knowledge", but by "interpretation", which is a Third Kind of Knowledge (364). With

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this one might compare Wittgenstein's celebrated statements in the *Tractatus*, 4.121, etc., and the opposed conclusion reached by Carnap, whose "metalanguage" *may* be a part of the "object-language" it describes. I am sure that one reason why one feels that code-construction cannot be the whole story, is that, when we have finished our "code for logic", the question whether the calculus we have invented can truly be interpreted as a code for logic is still open to discussion. It has to be answered as best we can, by a comparison between our calculus and what we take to be the principles of valid reasoning. And this is only partly the comparison of two formulated languages: for mostly we have to compare a precise calculus with a living and changing language. This cannot be done by rule of thumb, and may be called "intuitive" in the sense that it rests upon unanalysed general experience. What above all distinguishes real thinking from calculating is that in the former we have always to attend to shifts of sense. So that the building of a deductive code is the achievement of past "genuine reflective thinking" as well as a substitute for future reflective thinking. As Prof. Urban says, a "code for æsthetics" is out of the question—surely because here the shifts of sense are oceanic and unchartered.

(3*b*) With regard to postulate-sets there seems more point to the author's objection that the symbols of logistic are not "linguistic". For if he means to refer to uninterpreted calculi, his view is correct although the reproach is misdirected. For the distinction between a calculus and a language (between a code-form and a code for —) is well established in the science, and the informed logistician does not try to pass off the latter for the former. Of course, a mere calculus, as such, cannot give us principles of valid inference—cannot be a code for any part of logic or science. That is a mere tautology. But even where the logistician is not interested in any particular interpretation, and is concerned only with the comparison of calculi, he is commonly comparing *possible* languages. For calculi are usually developed in accordance with the laws of foundational logic, and may, if one likes, be held to include a basic calculus whose interpretation is assumed in advance. (See Carnap, *Encyclopedia of Unified Science*, I, No. 3.) And even where inconsistent (or otherwise eccentric) basic calculi are used, I think the procedure may still be called a part of the criticism of orthodox logic: for at least such calculi will serve to show the value of the "genuine article". The pitch is queered, however, by the "Pure Form" school, who sometimes insist that they are studying *mere natural structures*, and deny that these structures have any particular concern with language. But the same puzzle haunts classical logic too: is *it* the study of what we take to be the most highly general facts about nature or is it the study of the basis of our language for describing nature? I suspect this is a Schein-frage if ever there was one, and I do not believe Prof. Urban would take it seriously either (*cf.* 333, etc.).

(3*c*) Is the thesis of *Principia Mathematica* a part of logic? Does

it really show that pure mathematics is an extension of the traditional criticism of inference ? It does, according to the authors and Ramsey and Stebbing. We may ask (i) is the necessity of mathematical principles just the same as the necessity of logical principles ? Or (ii) can mathematics be deduced from purely logical principles ? And even if we are prepared to say Yes only to the first question, it seems to me that we are obliged to regard the " logic " of *Principia* as a critique of inference in just the same sense as Aristotelian logic ; for both alike confirm, exclude, re-arrange, clarify, our methods of serious argument. Logic began as a critique of Rhetoric, *i.e.* of arguments chiefly in qualitative terms ; it proceeds most naturally to the criticism of quantitative statements, as soon as the physical sciences finally oust metaphysics and theology from the top places in the Ladder of Knowledge. (*Cf.* Ramsey, *The Foundations of Mathematics*, p. 62.)

So that my conclusion is that the distinction between logic and mathematics is a mere matter of convenience, and must not be regarded as a denial that symbolic logic, in its various branches, is a part of the criticism of inference.

(4) Prof. Urban also believes that the true logic of language is a subject-predicate one. He regards the modern distinctions between class-inclusions, relations, and predications, as important for the purpose of discriminating between implications (294), but maintains that logic must *assume* that propositions " have sense ". And it turns out that a proposition has sense if, and only if, " it is an assertion about something, and this assertion predicates something of the subject ". And " west of B " is, he says, as much a predicate of A, as " red " is a predicate of " rose ". This is defended only by reference to intuition, and here again, although Prof. Urban may have something useful to say about the non-logical senses of " meaning ", I think that he imports what he has to say into logic itself, and that the result is obscurantist.

(5) The author rejects Russell's Theory of Descriptions (297, etc.). He is unable to accept the view that *The King of Utopia is kind* is meaningless ; nor can he hold (with Russell) that it includes a description that applies to nothing. That, he says, would certainly mean that it is a pseudo-proposition. He is sure that such descriptions stand for genuinely real things : but I suspect this is because he confuses two different senses of " name ". One can say that " red " is the name of a colour, but that " the colour of letter-boxes " is a description of a colour composed out of names of other universals. Or one can reserve the word " name " for words that denote genuine individuals, constituents of facts, things. Prof. Urban seems to hold both that all significant signs are names or made up out of names, and that names must stand for something—for some one thing or individual in some sense. Now of some descriptions we cannot pretend that they apply to physical existents whose acquaintance could be made via the senses ; but Prof. Urban does not stop here, for

he is prepared to deny outright the " prior (or exclusive ?) rights of the physical " : this he regards as an arbitrary assumption which makes it impossible to describe our own minds or to know other people's. Why not, then, other universes of discourse, mutually acknowledged in communication ? This has been said often enough before, *e.g.* by Russell in his *Principles of Mathematics* : Prof. Urban adds his characteristic doctrine that " existence " itself can be used metaphorically. So that we must say that Redness, Roundness (and, I suppose, Round-Squareness) exist as essences, but not as physical things exist. Without trying to deny non-physical constituents, I think one can see that the author is quite mistaken in the exegesis of his Real Essences, and quite mistaken in his denial of the Theory of Descriptions. His speculations here are no substitute for the patient logical analysis which he abolishes : and it is to be hoped that inexperienced readers will take the trouble to look up his references to the writings of Russell and others—without this corrective Prof. Urban might be dangerous.

(6) The attack is extended to the whole technique of logical analysis. Prof. Urban says " it is assumed (by the Analysts) that a stand-point outside discourse can be found from which the irrational and ill-fitting character of language can be determined " (333). This means, I think, that some metaphysical theory about reality itself is presupposed in any attempt to decide which linguistic forms faithfully reflect the structure of reality and which do not. *Aliter*, any method of logical analysis discriminates against certain current idioms on the ground that they suggest a view of the structure of reality which (it is known independently) is a false view. I think it is true and important that logical analysis (and especially the so-called Directional Analysis) has been used as an instrument of materialistic metaphysics—even by those who pretend to show by analysis that all metaphysics is nonsense—, but, as Prof. Urban says, the validity of the technique can be discussed independently of these special uses. And it seems to have come to stay because, without the help of metaphysical assumptions, it enables us to dismiss certain expressions as having no strictly informative, true-or-false meaning at all ; and to see that certain other expressions are especially liable to lead us into illegitimate inferences, and had therefore better be replaced by others, or used only with these others in the back of our minds. Prof. Urban refuses to believe that a sentence of discourse is ever wholly without informative meaning : does he not hold, " with Plato ", that " there is no use of language which is not indicative " ? (287) But if one avoids this trap, one might think that " There is a round square on the table " is determined to be nonsense by linguistic criteria alone. For it *is* possible to exercise a purely internal critique of language. The basis is the comparison of different forms of expression, usually within the same language ; *e.g.* " I travel ", " I exist ". The former implies the denial of " I do not travel " : but the second cannot be significantly contradicted at all.

(Surely " I do not exist " would be rejected even by Prof. Urban : for what could better be described as a " stultification of discourse " ? *Cf.* 290, 305, etc.) *Cf.* " Unicorns are fierce ", " Unicorns are imaginary " : from the former we infer that Unicorns exist, and it is by analogy with this that we are inclined to say that the second must also imply their existence. And if we did say so we should be wrong. Of course, the question remains, *which* of the two expressions is misleading : but we have already demonstrated that one or other is, and that improvement is needed. And this desire for a greater clarity than natural language affords is, as the author says, by no means confined to Nominalists, Naturalists and Positivists : it has a place also in the central tradition of Orthodoxy. And who can deny that the modern techniques have led to the invention of clearer modes of expression ? Even Prof. Urban admits their value " for the purpose of logic " (294). He is led astray, however, by his notion of intuitive meaning, and by the dangerous half-truth which he constantly repeats : " Logic assumes that terms have meaning and that propositions have sense, but cannot determine that meaning and that sense ". It certainly is the business of logical analysis to determine what is the syntax intended for a given expression : this enquiry relies partly upon general language-experience, but there most certainly is a technique here which can be learned and which can be progressive. But the analysis is not only exploratory, it is remedial : new expressions are adopted or invented in order to make valid inferences more obvious and invalid inferences less tempting.

(7) I now turn to Prof. Urban's exposition of the principles of symbolism (especially Chapter IX). Symbols are defined as a sub-class of signs, and signs are divided into designative, expressive and substitutional ones (407). Later, however, he classifies symbols to include " extrinsic or arbitrary " symbols, and these appear to be the same as purely designatory signs (414), as a comparison of the two passages will show. The author also hesitates over the " symbols " of logic and mathematics : these are called " symbols of an auxiliary and substitutional character ", but I suspect he really means to dismiss them as not being symbols in his sense of the word. I think he might have been well-advised to devote a special chapter to the purely *formal* parts of language, including the logical constants of ordinary discourse : his main aim here is to distinguish metaphor from non-metaphorical language.

(8) Any linguistic sign must have something in common with what it signifies, and this something is called the " Form of Representation ". The phrase is taken from the *Tractatus Logico-Philosophicus*, and Urban's theory is developed as a supplement to, or deviation from, Wittgenstein's. It is true only of plain literal prose, he says, that it must be a " logical picture " and share " logical structure " with its object (420). Other Forms of Representation are in use and these do not yield logical pictures at all (358)—are perhaps not even pictures at all (354, 357, 406). (The author even

says sometimes that there are symbols without Forms of Representation, 409, 415, 432.) Aesthetic, historical, scientific, religious, poetic languages have each their own Form of Representation, and the " sense " of each language requires an interpretation of the speaker's intention. Now it is clear that we cannot make much of this notion of a-logical pictures and a-logical Forms of Representation, unless we can grasp clearly what Wittgenstein meant by a " logical picture " ; and I think that Urban's rather surprising remarks about mathematical formulas and musical scores show that he has not himself managed to make much of this extremely difficult doctrine (356). A discussion of the problem is to be found in the *Proceedings* of the Aristotelian Society, 1938-39, by Mr. Max Black. Mr. Black's conclusion is negative : we are unable to determine the logical structure of any fact because we cannot be sure what are the ultimate elements in it, and it is these elements that are " structured ". We cannot be sure, because we have no test for deciding whether any expression of the fact is fully analysed. So that the logical Form of Representation—what an expression must have in common with what it represents—is an altogether empty notion. If this really be so, it is unlikely that Prof. Urban's a-logical Forms of Representa- add much to the general thesis that a symbol must have *something* in common with what it symbolises. To this more general thesis I now return.

(9) " The essential character of every symbol is that it is a metaphor " (433). We may, perhaps, draw upon Mr. Richards' *Philosophy of Rhetoric* for a convenient terminology : let us say that, in the line " Gather ye rosebuds while ye may ", Herrick has pleasures and triumphs as his *tenor*, and the buds of roses as his vehicle, by means of which he describes his tenor. Such a deliberate, emotive metaphor is a poetic device : but it is symptomatic of a much wider and less conscious activity. And both Mr. Richards and Prof. Urban use the word " metaphor " to cover this wider activity. It is, says Urban, the discovery of new meanings and their fixation and determination by means of old names (177). This rests upon the discovery of some likeness, or other connection, between the tenor and the vehicle and this connexion is called the *ground* of the metaphor. It is curious that Prof. Urban regards onomatopœic words as symbolic : here, presumably, there is some sensible likeness between the meaning and the sign itself—as murmuring sounds like the word " murmur ". It is not clear whether such " symbols " are supposed to be metaphors, and in most cases where he speaks of a connexion between the symbol and the thing symbolised, " the symbol " means the tenor itself and not any sign for it. Prof. Urban is right in allowing a wide variety of possible grounds, including sensible likeness, but including also similarity in emotional and other associations. He quotes with approval some extremely interesting words from the *Critique of Judgment* (B, 248, etc.), where Kant describes the ground of the symbolic relationship between the State and a machine:

there is, he says, no similarity in the objects themselves, but a subjective similarity " in the rules according to which we reflect upon these two things and their causality ".

The invention of metaphors, in this wide sense of the word, is the natural and unavoidable means by which we describe qualities and relations for which no special word has been appropriated in the past. When I predicate " greenness " of Life, " I am bringing to light some aspect or character of (life) . . . which could *not be determined and expressed except by such a transfer* " (179). And normally I could not justify such a transfer in detail: for the grounds are not fully present to consciousness. " It is precisely the function of the symbol, partly ' unconsciously ', to relate two contexts or domains of discourse hitherto unrelated " (423). This also serves to divide " natural metaphor " from fully conscious and analysed " argument from analogy ". Prof. Urban believes, however, that such predications rest " upon the assumption that analogy is a genuine feature of ' things ', and that between different contexts and universes of discourse there exist such relations that a name can be transferred from one to another and still have reference " (180). (Whereas one might have said: Just as it is a truism that everything is unlike everything else, is itself and not another thing, so also it is a truism that everything is in some way like everything else.) This account of metaphor seems to me to be well done and to open the way to many fascinating problems of language.

(10) It remains only to discuss what Prof. Urban calls " insight symbols " (415, etc.). Those universes of discourse which cannot be described literally in physical terms, must, he holds, be described metaphorically in physical terms, at any rate in the first instance. (Mr. Urban uses the word " empirical ", but he understands the principle of empirical verification to exclude all propositions not in principle verifiable *in sense-observation*, and often speaks of it as the " assumption of the prior rights of the physical ".) And it is easy for him to show that the vocabulary of mental life is drawn from physical metaphors; and that wherever we pass into a novel and unchartered realm of discourse we describe it by metaphors from a more familiar realm (183, etc.). It does not follow, however, that the new realm can never be described in literal terms: for we soon come to use the metaphorical word (*e.g.* mental depression) in a sense which is confined to the new universe of discourse, and in which it no longer connotes any special connexion between the tenor and the vehicle. It has then become, or may well have become, a univocal, plain prose-word.

But Prof. Urban is for ever greater heights. One notices throughout the book a yearning for the higher, the rarer, the nobler. There is, he believes, a realm of Real Universals, including real and objective value-universals (159, etc.). His personal interest is above all n those metaphors by which man attempts to describe his met-empirical experience of these real objects. " It is characteristic of

all symbols," he quotes from Höffding's *Philosophy of Religion*, that " images and ideas are taken from the narrower, more intuitable relations and used as expressions for more universal and ideal relations which, because of their pervasiveness and ideality, cannot be directly expressed " (408). There are fundamental metaphysical truths which cannot be adequately expressed except in metaphor—in what he calls " fundamental metaphor ", *i.e.*, by a vehicle chosen from one or other of " those ultimate and irreducible aspects of experienced reality without which experience could not be " (662). It is in such terms that the *Philosophia Perennis* is necessarily expressed, although Urban recognises that it is a primary aim of philosophy to state the broad general metaphysical principles in as non-metaphorical language as possible (634, etc.). To this I feel obliged to remark that if we confine ourselves to meanings that are strictly informative, I do not see how they could be *not in principle* statable—and clearly statable—in literal terms. Such terms would be largely dead metaphor, it is true: but the most literal language of the most commonplace physical description is also very largely dead metaphor. The mere fact that we must use metaphor in the description of novelties does not in the least imply that these novelties are of a higher, or even a different, type from the vehicles used; nor that it is going to be forever impossible to develop a literal vocabulary. All this Urban certainly acknowledges. There is nothing in the nature and operation of metaphor itself that necessitates " insight symbols ". These are required because higher, esoteric realms are postulated: these arise out of Prof. Urban's Realism, and I have tried to show that this Realism rests upon a misunderstanding of the ways in which different kinds of words have " meaning ".

KARL BRITTON.

A Sacramental Universe: being a Study in the Metaphysics of Experience. By ARCHIBALD A. BOWMAN. Princeton University Press. Oxford University Press, 1939. Pp. xxviii + 428. 22s. 6d.

THIS is a work of metaphysical construction: it is a work of major importance. Prof. Bowman employed the occasion of the Vanuxem Lectures at Princeton, delivered in March, 1934, to bring to systematic form the main results of more than twenty years of mature reflexion. Although his untimely death in 1936 interrupted at half-stage the revision and expansion of the lectures as delivered, they constitute as they stand a well-articulated body of thought, presenting a world-view whose salient and arresting character springs from a vein in the best sense original. There is not a line of school-bred stuff in the volume: it expresses the hard-wrought conviction of a peculiarly genuine spirit.

The work has been edited, and helpfully edited, by Prof. J. W. Scott, of University College, Cardiff. The first of its three parts, occupying three-fourths of the volume, is the definitive text elaborated by Bowman from three of the six lectures. The second part, of forty pages, is a literal transcript of the extant manuscript notes for the Vanuxem Lectures: these notes, fortunately, enlarge on just the concluding lectures which did not have the advantage of Bowman's revision. The third part presents relevant passages from Bowman's lecture courses in Glasgow, chiefly on the theory of values and on the psychology subsidiary to ethical doctrine. In this arrangement of the materials, the editor has—I think with sound judgment—made the event of the Vanuxem Lectures subordinate to the presentation of Bowman's philosophy in its systematic integrity.

Because of this, the title of the book (which is that of the lectures) is less indicative of its actual content than the sub-title. Of his total plan Bowman wrote: "This is a book about the world rather than a book about God". He describes it modestly as "an assemblage of considerations bearing upon an enquiry more comprehensive and fundamental", a set of metaphysical prolegomena. Yet there are few of the major problems not touched on; and in the end a conception of the world emerges for which the main title offers a precise description, within Bowman's scrupulously careful terminology.

It is perhaps well for the appreciation of his argument that the part which is most nearly finished is that part in which Bowman takes explicit issue with current trends in philosophy, notably with the work of Santayana and Whitehead. Though the literature dealing with these thinkers is extensive, I know of no essay on either of them which can be compared with these chapters in penetration of their thought and in cogency of criticism. He shows himself a thinker of comparable stature and philosophical workmanship, though his technical apparatus is of the simplest order.

I.

This apparatus consists in a definition for his own purposes of the concepts 'function' and 'system'. It is Bowman's contention that these two concepts, so fruitful in mathematics, physics and biology, may be equally fertile in exploring the "spiritual modality of being". Much of the critical part of the essay may be resumed in the thesis that a self is a 'system' in its own right, and as such is descriptively independent of physical being, which constitutes a second and equally self-sufficient system. The most pertinent description of the universe is that which begins with the recognition of the thoroughgoing distinctness of these two systems—a duality (though not a dualism) of physical and mental. Other aspects of the universe are to be understood as functions of the interaction of these two systems—in particular, nature (commonly mistaken as primary), the system of values, morality, history.

To say that mental events constitute a relatively self-enclosed group of entities, capable of systematic description by themselves, may appear nothing more than the current assumption of scientific psychology : Bowman's proposal is in explicit contrast to this assumption. As a natural science, psychology assumes that the ordinary formula of functionality, $y = f(x)$, is a sufficient account of the relations between mental events, and also between mental and physical, in which the physical is taken as the independent variable, x, in a relation of one-way dependence.

This type of dependence, fairly representative of the earlier conceptions of causality, is now seen to be inadequate even for the physical world. Wherever we have $y = f(x)$, Bowman points out, we have also $x = f'(y)$. The mathematical dependence is reciprocal, and is embodied in the ' law ', f or f'. An ontological study of dependence, however, will not be satisfied with simple calculability : it will recognise that the ' law ' also is among the data on which x and y depend ; " The true determinant is the systematic character of the relationship that unites the two terms ". These two considerations mark the transition from simple functionality to 'system' ; for wherever such dependence obtains we may define any member as a function of a whole which includes itself : $y = f(x, y)$. Such a whole is a ' system '. Every term within the system is a function of the system as a whole ; and " every term which is a function of a system must have a place within the system " (p. 22).

An obvious objection at this point may bring out the force of the formula. If we were hoping to calculate an unknown y from a known x, the formula $y = f(x, y)$ would seriously impede progress and in many cases defeat us. Unless we can throw the formula into the shape $y = f''(x)$, we must first know y in order to find y ! The current one-way formula is a necessity for mathematical discovery. But as indicating concrete relationships, especially such as follow an organic model, to say that each part depends on a whole which includes itself, and is thus circuitously dependent upon itself, appears to be a precisely empirical statement of the case. (It may be observed in passing that Whitehead in setting up his own conceptual apparatus does not shrink from such a circuit : for he attributes to his unit of being the rather staggering property of ' self-creation ', which would seem to bring Spinoza's *causa sui* down into the details of the world.) It is this " principle of reduplication " which Bowman intends to signalise in his functional definition of ' system '.

With this definition, Bowman proposes to substitute ' system ' for ' substance ' as a primary metaphysical category—the *prius* of whatever comes to be. Thought and extension are systems, not substances ; yet the substance of ' substance ' is not all sacrificed, for at the same time ' system ' is substituted for ' process ', and dilemmas of a flux-philosophy are avoided.

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II.

Bowman deliberately accepts the onus of reinstating mind in the position of near-independence which it enjoyed in the Cartesian era. He opens his essay with a full recognition of the cognitive disadvantages of the mental: his business is with that which " as often as we name it,—mind, soul, personality, spirit,—lays us open to the charge of obscurantism ". He sets himself squarely against the trend toward *rapprochement* between physical and mental. His demand is that " the physical factor must be taken seriously ". The current effort at fusion of physical and mental is confusion, since the mental is " irreducibly non-physical ". And it is because Santayana and Whitehead exemplify this confusion that he chooses them for extended examination.

His mode of argument is not dialectical in the sense that it professes to uncover self-contradiction; it is another form of *reductio ad absurdum,*—showing that efforts to avoid the duality of mental and physical have resulted in new dualities less credible, less intelligible, less amenable to systematic treatment. He gives his test the unpretentious name of " methodological effectiveness ". I could hardly regard this, and I doubt whether he regarded it, as an ultimate metaphysical criterion; but as meeting those whose idea of metaphysics is " an adequate conceptual description of the world ", it is capable of doing a satisfactory amount of slaughter.

Santayana floats in a sustaining sense of the unity of experience, the flux of homogeneous neutrality, out of which physical and mental can be conceptually segregated. But this monism is surrendered when on one side the ' essences ' pull away into a timeless (and helpless) realm of their own, while ' substance ' obtrudes like an uneasy ghost into the admirable flatness of the empirical scene as something meant by an irrepressible faith, a faith whose refractory and irrational nature is recorded in the adjective ' animal '. The flux itself is a *tertium quid* in this self-shattering scheme, both insubstantial and meaningless; for while all substance is identified with the inaccessible ' matter ', all meaning belongs to the realm of essence, and Santayana's essences do not as in Whitehead's system ' ingress ' into the flux.

The self, for whom in Santayana's scheme the world presents this broken character, is itself shattered. For the self is part ' psyche ' and part ' spirit ': the psyche or animal soul self-concerned and partial, the spirit disinterested and catholic. This dual self is conceived as a product of material nature; but to produce psyche and spirit out of itself, matter must be pregnant with the possibility of both. This is hard on the notions both of matter and of spirit, for while " spirit can never survive the scandal of its origin in the womb of the psyche ", matter is obliged to acquire " an alien character of subjectivity ", " and so the concepts of both nature and spirit are obscured " (p. 74).

III.

Whitehead is more determined than Santayana in his opposition to the Cartesian dualism, in which with Dewey he sees the root of most of the disorders of modern metaphysics. He proposes to overcome the antithesis of mental and physical at two points : (1) cognition and causal interaction are to be assimilated—both being cases of ' prehension ' ; (2) the physical events and the ' secondary properties ' are to be reunited in the concrete movement of nature —bifurcation is to be rejected as a philosophical scandal. These two acts of mending the cleft world do to some extent support one another, since the qualities can only be got back into physical nature if causation is a case of prehension, and prehension is conceived after the pattern of perception. But this is a violent union whose instability Bowman carefully exhibits.

The process of nature cannot, as a quantitatively lawful passage, support the infinitely varied and ever-novel congeries of qualities except at the cost of a distinction, that between ' events ' which are passing and unique, and ' objects ' which are eternal and changeless. It is precisely the shimmering web of novel quality which, in this scheme, is interpreted as the incessant arrival of new instances from an infinite realm of ' eternal entities '. How then can the eternal entities come to characterise passing events ? They ' ingress ', we are told : but what is ' ingression ' ? The term suggests a process and therefore an event in time ; but since it is events we are trying to understand we cannot call on an event to explain them. Ingression cannot be a vicissitude of the eternal object, for by its own nature nothing can *happen* to such an object : it cannot be a vicissitude of the event in which it is ' situated ', for the event is itself a vicissitude. " Objects are the character which events contract when they transpire ; but that character is not conveyed to or from them in any of the ways by which the events themselves come about or pass away " (p. 116).

Thus we are again threatened by a dualism with which we can operate only by the aid of artificial assumptions. The notion of ' prehension ' is extended to include the relation of the growing ' actual occasion ' to a selected portion of a realm of non-extant eternal objects. But when ' prehension ' deals with actual and non-actual, and deals selectively, it must become avowedly perceptual. Thus Whitehead comes to speak of ' percipient events '. This device Bowman characterises as " a somewhat hesitating and altogether inadequate admission that the concept of natural events with objects situated in them is insufficient to account for the world of sensory and perceptual experience. . . . Its workability depends on an oscillation of thought whereby physiological processes are interpreted in terms of psychical states and psychical states in terms of physiological processes " (p. 117). The system which started with a courageous closure of nature to mind ends in a recrudescence of primitive animism, escape from which was a primary condition for the beginnings of modern science.

IV.

Another aspect of the current philosophical superstition, the physicalising of mind, is the notion that mind is in some respect spatial: to this point Bowman devotes a chapter of analysis (ch. iv) which brings him into conflict with E. B. Holt and Samuel Alexander. Bowman shows that thinking of an object is not identical with representing that object, whether by an image of itself or by another object (as by a map): it is a unique activity in which the object itself is meant or intended, and in which this 'intending' does not take on the character of the object intended. To think of a spatial object is not to become spatial. Not even when one is sensibly aware of one's own body does the mind accept spatial qualification; for this 'proprio-ceptive' experience is still an experience of objects in space (p. 154): the space of the body is not space of the mind (p. 170).

Bowman allows himself to be tempted here into a speculative excursion, inviting us to "think of the living body as an exclusive spatial system, out of all spatial relation to the space of the actual world" (p. 164). This, in my judgment, weakens the argument, and is unessential to it; though it calls attention most skilfully to the notion of a plurality of actual spaces, and to the intricate geometrical problem of body-orientation.

V.

The ground is now prepared for the positive construction of mind as a system of experience. Bowman calls his method 'critico-empirical' (p. 180): "As a beginning, I postulate being. I postulate it in as many modes as experience compels us to acknowledge". Experience presents the two modes, physical and mental, and presents them in clean disjunction: "nothing that exists in the one mode can possibly exist in the other" (p. 179). These two modes may be compresent and functionally related so as to constitute a single psycho-physical system of being: but whether this relation is essential or 'external', permanent or transient, is not involved in the fact of its existence.

The self-sufficiency of the mental mode can only be seen in the light of the appropriate conceptual tools. For these we look, not to psychology, but rather to language. Bowman hereupon explores the linguistic resources of Europe with a fine perceptiveness indicating that he had sensed the semantic problem long before its general vogue. He lights upon the term 'spirit' as the best expression for the systematic character of mind, partly because it does not connote "any such conception as Kant's unknown noumenal self—a conception which would immediately bring our enquiry to a close" (p. 188). The type of unity required for the flickering contents of a personal life is not one which can be defined by any spatial nor physical model; certainly not by reference to a transcendent element;

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nor by a simple descriptive recapitulation of the flux in a single narrative ; but by the organic character of the process of experience. If it is objected that a system of experiences is different from a subject of experiences, Bowman replies that the experiences are attributed to the system as its activities (p. 195) : the subject is not different from the experiences in their systematic character ; and this character involves a temporal synthesis uniquely different from temporal succession.

The physical world is presumably a systematic unity of all physical facts : but in the world of mental facts the most available example of a system is not a unity of all of them, but a unity of a special strand which is ' self-separating ' as over against other such strands —a ' person '. A person as a ' self ' exhibits beside its individuality and its identity in time-change the peculiar character of self-assertion through vicissitudes. Selfhood in this sense cannot be found in the non-mental. Lest it be alleged that certain non-mental forms, such as crystals, deserve to be called selves, Bowman makes an excursion into crystal theory to show that self-maintenance amid vicissitudes cannot be asserted in this region (p. 247).

With this descriptive criterion, Bowman puts forward the important theses that all selfhood implies consciousness, and that all consciousness is self-consciousness. There are subconscious mental states, but they are always subordinate to conscious states—a valid thesis which disposes of the groundwork of much contemporary gradualism (p. 256). The criterion of the human types of selfhood is to be found in a distinction between primary and secondary self-consciousness : the constant rill of self-enjoyment which belongs to all conscious life is preliminary to the explicit objectifying of self which makes possible self-judgment and self-direction. When this secondary self-consciousness becomes a preoccupation with life as a whole, we have the basis for the characteristic ethical and religious life of man.

VI.

The discussion proceeds to an examination of the status of the physical world. The physical is objective—that is, we find it in relation to our own subjectivity ; but it is ontologically independent of this relationship. For experience is *of* something not itself ; and the physical is " the non-subjective of which we have experience " (p. 290). The independence of the physical consists in its spatiality ; a position suitable to Bowman's exclusion of spatiality from spirit. But the position is difficult, not alone because there are mind-dependent spaces in plenty, but also because actual space, so far as it is present to the sense of sight, is admittedly " subjectively conditioned ". It is in the space not of perception, but of mathematical physics, through the strategies of exact measurement, that we define the independent object.

But the physical is also in time ; and time is a common factor of

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physical and mental. In an illuminating review of the history of physical speculation, Bowman points out that it has taken centuries to realise a truth divined by Greek insight, that time is of the essence of the physical structure itself: " in the absence of time, it is impossible to assign existence to space " (p. 327). Without a system, no existence (for system supplies the necessary identity in duration); and without time, no system.

The inquiry breaks off as the author is on the point of developing his theory of time, in which, as one perceives through the indications of the manuscript notes, the duality which is not a dualism find its inclusion in a wider system, which is spiritual. The physical world, in this wider context, appears as a created order.

VII.

The evidence for the world-view whose main lines were thus laid down must have come largely from its subsequent development and application, a development whose fruitfulness we can surmise through the sketches which remain. Of these, the theory of ' nature ' and the theory of ' value ' are drawn in some detail.

Remembering that, for Bowman, the physical is the pure object of physics in space-time, and the mental the pure self-sustaining system of personal awareness, it is clear that ' nature ' is neither the one nor the other: it is a function of their interaction. " The natural is the physical viewed in a perspective supplied by the spiritual mode of being " (p. 341). Until selves enter into this interaction, there may be a physical world, but no ' nature '. When selves appear in this relationship, then the physical " bursts into life and displays itself in a rich variety of manifestations unknown before ". The sensory qualities arrive, and with them the first order of values; for sensory qualities are values as well as facts.

With this foundation the hierarchy of values begins. Æsthetic values are found in the agreeableness and disagreeableness of sensory objects. Utilities, in the relations of objects to one another, and to purposes. Formal æsthetic values in the organisation of objects. Truth appears as a value in its own right. Sanctity is a level of value which arises in the emotions and judgments with which spirit regards spirit. Morality makes an object of all these values; it considers the possibility of creating and realising them; implying the activity of self in nature, and thus the possession of a body.

Creativity lies solely in the realm of spirit: the physical cannot advance creatively (p. 369); there is no creation in the physical until mind touches it; there is no physical at all until spirit creates it. The term ' sacrament ' implies the eliciting of value from that which in itself is valueless (p. 376). It is thus a term which applies to a universe in which the physical is throughout subject to the creative touch of spirit.

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VIII.

In its main lines, this metaphysical doctrine offers a vast relief from the artificial strain into which an impossible monism of nature has been cramping us. The way to advance in metaphysics lies through Descartes, not around him. The duality of things requires to be insisted on, and at the same time to be distinguished from dualism. Bowman's refusal to cure the bifurcation of nature by denying the mental component of its sensory aspects is a refusal in which reflective judgment will have to follow him. Nature as we experience it is not bifurcated; but it is bifactorial, and one of the factors is ourselves.

This implies that self is not intrinsically a product of nature; and here Bowman's book, recording his profound personal intuition of the autonomy of mental being, has its most notable thesis. It is a difficult thesis; and I would not pretend, nor would he, that all the difficulties have been met. The interlocking of the physical with the mental is too intimate to allow an easy disengaging of the independent thing. Those systems of intercourse between the two realms,—perception, volition, the body, the paths of heredity and of communication—all these rebel against separation. How is it that the cure of the soul may sometimes begin with cure of the body? Why does the Yogin discipline himself in breathing and posture in order to control his attention? Why does the military educator put his slower minds through a gymnastic quick-response drill in order to limber up their thought-processes? How is it that an unduly introverted mind may recover moral balance by a period of manual labour? Such functional unions may suggest that the mind belongs to the system of the body, or that the body belongs to the system of the mind: the difficult position is that they belong to separate systems. Nevertheless, Bowman must be right in the main contention, or else the self is not what the self knows itself to be—the originative element in the world. Its entanglement in nature must be such as to leave it essentially footloose, able to put *this* physical order completely into the position of not-self. How this unity and this disunion are both possible it remains for those to work out who can see what Bowman has seen and has aided them to see.

WILLIAM ERNEST HOCKING.

An Essay on Metaphysics. (*Philosophical Essays*: *Volume II.*) By R. G. COLLINGWOOD. Oxford: Clarendon Press, 1940. Pp. x + 354. 18s.

THIS is an interesting book, well fitted to absorb the reader's attention during an air raid. It is amusing and is, in my opinion, the best of Prof. Collingwood's philosophical writings. This is not to say that

I agree with it. I do not. But it is worth considering as a vigorous statement of a certain point of view, and it contains provocative criticism of some contemporary philosophers. Prof. Collingwood's style reminds me of a clever schoolmaster who explains patiently, condescendingly, and oh ! how brightly, to the Sixth Form a lesson which a few of them may be intelligent enough to understand whilst the rest may at least be impressed. Some readers may find this manner irritating ; I enjoyed it.

Prof. Collingwood is an historian—a specialist in Romano-British studies—as well as a philosopher. He believes that ' the metaphysician is a special kind of historian ' and that his training should consist ' first, in a general historical education ; secondly, in special attention to the history of science ; and finally, in concentrating on problems of the following type : Here is a document providing evidence about the history of science ; what light does it throw on the question what absolute presuppositions have been made ? ' (p. 62). It is natural that one's own specialist studies should be taken to be the most important, and certainly a training in history is of value to a philosopher. But if science is taken to include the natural sciences, it is difficult to believe that ' special attention to the history of science ' without training in one of the experimental sciences could suffice to enable the metaphysician to deal with problems of the type cited by Prof. Collingwood in the quotation given above.

The book consists of three parts : in Part I Prof. Collingwood explains what he takes metaphysics to be, why it is important, and how it is to be pursued ; in Part II, entitled ' Anti-Metaphysics ', he attempts to dispel certain misconceptions about metaphysics which have encouraged ' irrationalism ' in philosophy ; in Part III he offers *specimina philosophandi* in order to show how metaphysical inquiry ought to be conducted. Throughout the book Prof. Collingwood is concerned to warn us that ' irrationalism ', which he finds in unsuspected quarters, is a grave menace to the preservation of our civilisation. As he made clear in his *Autobiography*, he believes that ' realism ' is favourable to irrationalism, immoralism, and, in short, to Fascism. In the present book he says that the theory of knowledge called ' realism ' is ' based upon the grandest foundation a philosophy can have, namely human stupidity ' (p. 34). If this were true, we should have reason not only to reject realism but also to fear an increase in the number of its adherents.

Prof. Collingwood recognises that thinking is, as it were, a dialogue with oneself ; in thinking I ask questions and try to answer them, often finding that what seemed a single question splits into several, whilst each answer generates further questions. This has for long been my own view of the nature of thinking and I hope that it would meet with fairly general acceptance. What the questions are about is what defines the subject-matter of a science. According to Prof. Collingwood metaphysics is ' about a certain class of historical facts, namely, absolute presuppositions ' (p. 61). ' All metaphysical

questions', he says, 'are historical questions, and all metaphysical propositions are historical propositions. Every metaphysical question either is simply the question what absolute presuppositions were made on a certain occasion, or is capable of being resolved into a number of such questions together with a further question or further questions arising out of these' (p. 49). Every question involves a presupposition. These are of two kinds: relative or absolute. 'A relative presupposition', he says, 'is one which stands relatively to one question as its presupposition and relatively to another question as its answer' (p. 29). A relative presupposition admits of being verified or not; it is verified if the answer to a question about the presupposition takes the form of a proposition propounding the presupposition itself. An absolute presupposition, on the other hand, is said to be 'one which stands, relatively to all questions to which it is related, as a presupposition, never as an answer' (p. 31). Hence, we cannot sensibly ask whether an absolute presupposition could be verified.

Making great use of the fashionable word 'nonsense', Prof. Collingwood asserts that to ask about an absolute presupposition whether it is true, or what evidence there is for it, or how it can be demonstrated, is to ask nonsensical questions. Only propositions can be 'propounded', *i.e.* stated, for only propositions can be true or false; absolute presuppositions can only be presupposed. 'The scientist's business', he says, 'is not to propound them but only to presuppose them. The metaphysician's business, as we shall see, is not to propound them but to propound the proposition that this or that one of them is presupposed' (p. 33). An example of an absolute presupposition is: 'that Newtonian scientists presuppose that some events have causes'; another is, 'that Kantian scientists presuppose that all events have causes'; a third is, 'that Einsteinian scientists presuppose that no events have causes'. The business of the scientist is to presuppose the presupposition which never stands as an answer to any other presupposition that he may make. Whereas the scientist presupposes, if he is a Newtonian, that some events have causes, and, if he is a Kantian, that all events have causes, and so on, the metaphysician states that each of these made the presupposition in question. Accordingly, Prof. Collingwood lays down a formula which he calls the 'metaphysical rubric': '*in such and such a phase of scientific thought it is* (*or was*) *absolutely presupposed that. . . .*' (p. 55). We are to be allowed to omit the rubric provided that we are intelligent enough to remember that it must be put in; we must not be allowed to forget that every metaphysical proposition requires the prefix of the metaphysical rubric. It is in this way that every metaphysical proposition can be regarded as an historical proposition concerning the peculiarities of a certain phase of scientific thought.

When a metaphysician investigates the problem of what are the absolute presuppositions made in any given phase of scientific

thought, he will find that there is always a ' constellation ' of absolute presuppositions ; each of these must be ' consupponible ' with the rest but, being absolute, none is deducible from any other of them. Moreover, although the set making up the constellation are consupponible and are, in a given phase of scientific thought, absolutely presupposed, it is not logically necessary to suppose all if one supposes any given absolute presupposition. Hence, Prof. Collingwood concludes, metaphysics is not deductive. I should have thought that the suggestion that metaphysics, understood as Prof. Collingwood understands it, could be deductive would have to be regarded as nonsensical, since *every* metaphysical proposition is, on his view, a proposition to the effect that ' so-and-so absolutely presupposed such-and-such '. Such propositions do not, on his view, constitute the historical background of the metaphysician's work ; they constitute the work itself. Having stated the absolute presuppositions, the metaphysician has then to find out by what processes one historical phase passes into the next. These two inquiries are the only properly metaphysical inquiries. In this way Prof. Collingwood comes to the conclusion that metaphysics becomes a science by ' becoming more completely and more consciously what in fact it has always been, an historical science ' (p. 77). He concludes : ' The reform of metaphysics, long looked for and urgently needed, can be brought about by nothing more abstruse or difficult than its adoption of principles and methods which are now common form among historians '. There's nothing like leather, and it is not perhaps altogether surprising that Collingwood the historian has convinced Collingwood the philosopher that metaphysics is a special kind of history, and that both of them together have convinced Collingwood the man of action that the saving of our civilisation depends upon adopting this view of metaphysics.[1]

Pseudo-metaphysics consists in asking whether absolute presuppositions are true, or what evidence there is for them, or how they can be demonstrated. Pseudo-metaphysics is largely responsible for what Prof. Collingwood calls ' anti-metaphysics ', which is ' a kind of thought that regards metaphysics as a delusion and an impediment to the progress of knowledge, and demands its abolition ' (p. 81). He distinguishes three kinds of anti-metaphysics. (1) *Progressive Anti-metaphysics.* This is dismissed rather easily as the attitude of amateur metaphysicians who are uneasily conscious of their amateur status and so deride what they cannot achieve. They see that something is wrong with the work of those they call ' metaphysicians ' but they do not know how to set it right. (2) *Reactionary Anti-metaphysics.* This is primarily an attack on presuppositions made by contemporary science but treated as though they were propositions and thus capable of truth or falsity. The reactionary anti-metaphysician is primarily a reactionary in science and only

[1] For an account of the three 'Collingwoods,' see his *Autobiography*, pp. 150 *seq.*

secondarily a reactionary in metaphysics. (3) *Irrationalist Anti-metaphysics*. This is the most far-reaching of the anti-metaphysical errors; it aims 'at the ultimate abolition of science itself, in order to bring into existence a form of human life in which all the determining factors should be emotional' (p. 83). The psychologists provide Prof. Collingwood's chief example of anti-metaphysics in its irrationalist form. Psychology is, he holds, the science of feeling; to regard it as the science of thought is to make it into a pseudo-science, since no reference is made to the truth or falsity of the thinking. The science of thought is logic, or, as he prefers to say, 'criteriological'. He discusses some of the work of W. McDougall and some of the work of Spearman in order to show that psychologists fall into one or other of three mistakes: they discuss a topic which does not belong to the field in which they profess to carry on their discussion; or they fall into self-contradiction; or they plagiarise and present what everyone knows as though they had made a discovery of their own. The psychologists may be left to answer these charges; they are, in fact, preliminaries to Prof. Collingwood's supreme charge, that psychology is 'the propaganda of irrationalism' (p. 142).

Positivistic metaphysics is considered at greater length as an example of pseudo-metaphysics taking itself to be anti-metaphysics. The mistake of the positivists, from J. S. Mill to Mr. Ayer, is said to be that they wish to find reasons for their absolute presuppositions. Prof. Collingwood holds that Mr. Ayer has failed to notice that what he calls 'metaphysical propositions' and rightly sees not to be susceptible of verification are not propositions at all but absolute presuppositions.

Having disposed of the anti-metaphysicians, Prof. Collingwood offers us, in Part III, three specimens of how metaphysics *ought* to be done. The first specimen is provided by the proposition 'God exists'. This is an absolute presupposition; accordingly, we should not speak of the *proposition* 'God exists', but of the *presupposition*. The corresponding metaphysical proposition is the historical proposition 'we believe that God exists'. Those who reject Anselm's ontological proof are said to do so because they dock the proposition 'God exists' of the metaphysical rubric. Prof. Collingwood sums up his discussion by a consideration of the Athanasian creed, and comes to the conclusion that the 'presuppositions that go to make up this "Catholic Faith", preserved for many centuries by the religious institutions of Christendom, have as a matter of historical fact been the main or fundamental presuppositions of natural science ever since' (p. 227). I should like to be able to discuss this assertion, which certainly contains some truth, but to do so would take much more space than is at my disposal. For the same reason I must refrain from discussing Prof. Collingwood's other two specimens: the Metaphysics of Kant, and Causation. The latter has already appeared, in a somewhat different shape, in the *Proceedings of the Aristotelian Society*.

Prof. Collingwood supports his view of metaphysics by reference to the authority of Plato. He describes what he chooses to call '*the* dialectical method' as the process of 'removing hypotheses'. The dialectician resembles the metaphysician in bringing hypotheses to light, but 'in "removing" them he is doing something which it is certainly not the metaphysician's business to do' (p. 158). Prof. Collingwood has no difficulty in showing, after Adam, that Plato's first account of 'dialectic' does describe this process of 'removing' hypotheses, and that in translating *ἀναιρεῖν* as 'confirming' the Oxford commentators fell into a bad blunder, rightly corrected by Adam. I venture to suggest, however, that Prof. Collingwood himself falls into a grave mistake by assuming that Adam would have agreed with him in taking this first account of dialectic as Plato's final account. Adam shows that Plato does consider it the metaphysician's business to 'ascend' from the hypotheses to first principles. Thus Adam says: 'He (the dialectician) begins by offering a *ὑπόθεσις* on the subject to be discussed, and then proceeds to test his *ὑπόθεσις* by the conclusions to which it leads. If these conclusions are untenable, the original *ὑπόθεσις* is cancelled or annulled (*ἀναιρεῖται*), and a new suggestion takes its place, only to suffer the same fate. The process is repeated again and again, until at last we reach an *ἀρχή* which will withstand every test'. Adam concludes: 'The result is a number of true and irrefragable *ἀρχαί*, apprehended . . . in their relationship to the supreme Idea, which is itself, when we have climbed to the summit, no longer a *ὑπόθεσις*, but an *ἀφχή ἀνυπόθετος*'.[1] I draw attention to Prof. Collingwood's mistake because it has led him into supposing that his theory about Absolute Presuppositions and the metaphysician's business with regard to them is correctly derived from the practice of Plato and Aristotle. It is an odd mistake for a scholar to have made.

In my opinion the business which Collingwood takes to be 'the business of the metaphysician' is important and interesting. We need to search out the presuppositions upon which any given phase of scientific thinking rests, and to examine how one phase passes into another. When the presuppositions are those made by natural scientists, then this inquiry falls within the scope of what is commonly called 'philosophy of science'. There remains, however, the question of the relations or want of relations between the absolute presuppositions made by one specialist natural scientist and another, and between these and the presupppositions of the historian (in the narrower sense of 'history'). I do not think that Prof. Collingwood has succeeded in showing that all such questions can be answered in terms of his metaphysical rubric. The attempt to 'reform metaphysics' by substituting a special kind of history for metaphysics may commend itself to a thinker who is primarily a metaphysician, but it is not likley to be accepted by those who are

[1] See J. Adam, *The Republic of Plato*, vol. ii, p. 176.

interested in what have been called 'metaphysical problems', whether their interest takes the form of trying to show that these are pseudo-problems or the form of trying to restate them as a preliminary to solving them. The fact that Descartes and Newton in the past, and Einstein to-day, have done much to advance the study of metaphysics does not show that metaphysics is either natural science or history; it shows that Descartes, Newton, and Einstein are themselves capable of metaphysical thinking or, in short, are also metaphysicians.

L. SUSAN STEBBING.

V.—NEW BOOKS.

The Ways of Things. By W. P. Montague. New York: Prentice-Hall Inc., 1940. Pp. xviii + 712. $4.00.

This very interesting and comprehensive work is marked by ideas which, whether always sound or not, have at any rate the merit of being brilliant, and by a style of high literary quality which makes the reading of the book a very pleasant task. It is far from being a systematic treatise, since it is composed largely of a number of essays published at diverse times on all sorts of widely differing philosophical topics, and no attempt is made to connect them into a well-rounded whole except that the book begins with a summary of the author's general philosophical views, comprising about a fifth of its length, and ends with a most interesting autobiographical sketch of their development. This mode of composition involves a certain superficiality which might have been removed if the author had set out his opinions on particular points more fully. I think that, since many of the articles were published a long time ago, it would have been very desirable to append notes to them recording any subsequent development in the author's views and replying to any new points that had been made since the date of publication raising difficulties for his type of view, but I can understand that he shrank from either adding to the length of the book or omitting any of the valuable articles included.

To start with epistemology, Prof. Montague's main views on this subject are similar to those already expressed in *The Ways of Knowing.* He will no doubt be much blamed for falling back on the question-begging notion of the subsistence of all objects of thought, but he argues that such a notion is presupposed in ethics, since ethics must maintain "that ideals are real in their own right, that they require not the will of God, nor the might of nature, nor the edicts of society to make them better than they are" (p. 279), and that this can only be expressed by the doctrine of subsistence. But surely, if he admits subsistence at all, he might have made a sharper distinction between (1) ethical and other principles which are held to be subsistent because we can assert true propositions about them although they are not existent, and (2) objects of thought which have no existence because the thought is in error. It is also obscure what more you have said when you describe something as subsistent because it is an object of thought than just that it is an object of thought, or what more you have said when you describe an ethical principle as subsistent because propositions about it are true than just that you can assert true propositions about it. Some answer should have been given to the challenge of positivists and others on these points. Nor is the nature of the author's compromise between representative and direct views of knowing at all clear to me. Interesting, though all too briefly stated, parts of his epistemology are the defence of the idealist absolute as an *as if* concept (pp. 86-87), the revival of the Kantian distinction of intuition of space and time both from

sensory perception and from conception as a kind of perceptual assurance, opposed to imaging, which guarantees the existence of a single space and a single time (pp. 64-65), his reconciliation of the correspondence and coherence theories (pp. 265-269), and the analysis of induction conceived as exclusively a method of elimination (pp. 173-181).

One of the chief questions a reader is inclined to ask of an epistemology nowadays is how it treats positivism, a form of thought to which it is clear throughout that Prof. Montague is opposed, though he tempers his opposition by a search for means of conciliation. Positivism is criticised by him on the ground that "the meanings of experience transcend experience", for "relations of experiences are not exhausted by our experience of them", and "if we must go beyond experience with respect to *relations*, why not go on to *things*, substantives and substances, and so get back once more to a regular world?" (p. 85, *vide* also p. 72). But his epistemology aims at a synthesis of the conflicting theories of epistemology, which is effected mainly by assigning suitable spheres to each of them. The opposition between Ultra-empiricism and Ultra-rationalism he holds to be due to "the confusion of the things which change with the laws that do not", which tempts the rationalist to identify things with laws and so deny change, thus "promoting a fallible opinion or custom to the status of an unchanging verity and thereby impeding progress", and exposes the empiricist to the opposite danger of identifying things with laws and so "degrading objective truth to the status of shifting human opinion and thereby rendering progress blind and meaningless" (p. 219). Ultra-empiricism is also discussed in the article entitled "Substance, Potentiality and Cause", which, however, falls rather within metaphysics than epistemology on the whole. It seeks to reconcile positivism and rationalism by admitting the validity of the rationalist categories of substance, potentiality and cause, but finding their meaning in experience, namely one's experience of oneself. The pragmatic confusion of cognition and conation is criticised in the first part of an article on æsthetics (pp. 550-555).

In metaphysics the author claims to overcome the dualism between matter and mind by conceiving the mental as potential energy. This conception is worked out with considerable mathematical illustration. Without meaning anything disrespectful to Prof. Montague thereby one might say that the chief difficulty for philosophical readers of the book will be to make sure that his remarks on this topic are not "nonsense", a difficulty which may arise with some of the work of any philosopher. For the author himself it is redeemed from this charge by a very curious supernormal experience of his which gives it a rich meaning to him but which it is extraordinarily difficult to communicate to anybody else (pp. 666-668). But, for those not initiated into such an experience, it is somewhat difficult to see what can be meant by calling mind "potential energy", except that it is the cause of energy, which of course leaves the problems where they were. But I think, none the less, that it is worth while at least studying the theory put forward, and no sketch that I have space to provide here could give any idea of the theme's rich and varied development. After all, as Prof. Price has recently pointed out, the philosopher's fear of talking nonsense may be the greatest obstacle to advance in fields of study at the pioneering stage when our conceptions are not yet clear and fixed.

The author claims to prove causality, I think validly, by showing it to be fantastically unlikely that the regularities which empirically occur

should occur if they were not cases of causal laws (pp. 182-188). He uses a similar argument against the view that the instances of apparent teleology in nature can be accepted without explanation or as explicable simply by "evolution" mechanically conceived. Evolution presupposes at any rate the occurrence of useful variations, but "the number of meaningful combinations of letters is infinitely smaller than the number of meaningless juxtapositions, and similarly, the number of useful combinations of cells and cell-elements such as would be required to constitute an organ like an eye is infinitely smaller, and their occurrence is therefore infinitely less probable, than the number of useless or harmful arrangements" (p. 446). However, the author thinks himself debarred from a belief in the existence of an omnipotent God by the existence of evil. But he does not fail to appreciate the value of religion, when freed from the vices of asceticism and authoritarianism to which it is prone, and his conception of mind as energy not alien in character to that which constitutes matter naturally links up with a form of pantheism. He declares that "the God that I believe to be most probable is infinite and eternal like the universe which is His body, all-perfect in Himself and in His will to good, but limited in power by that totality of possible and actual beings which is within Himself yet not Himself, and which in what we may call evolution is undergoing the endless leavening and perfecting that such an infinite chaos would require" (p. 123), but the speculative reinterpretation of the doctrine of the Trinity in an article written in 1932 and published in this book (pp. 531-539) seems irreconcilable with this statement. I do not know whether this is to be explained by a definite change in Prof. Montague's views since the 1932 article was written, but in any case he holds in both that there is a power outside ourselves making for good which, though not omnipotent, is gradually establishing its preponderance.

In ethics he declares for a modified form of Utilitarianism. Virtue is regarded as the permanent potentiality of happiness for its possessor and others, and it is claimed that such a potentiality could be conceived as infinitely superior to its manifestations without introducing any difference of quality but only of quantity, and without supposing "that virtue has a principle of value other than the principle of happiness" (pp. 584-599). If to talk about potentialities is simply to talk about their manifestations, this view would seem after all to reduce itself to hedonism, but Prof. Montague's whole philosophy presupposes that a potentiality means something more than this, though it is very difficult to see what it does mean. But if we have a notion of the potentiality distinct from its manifestations, has he really overcome the dualism between the two types of good, virtue and happiness, as he claims to have done, since virtue and happiness then become once more distinct qualities? And surely what we see is not that virtue as a mere potentiality has any value in itself at all, but that its *actualisation* in virtuous action has a value which cannot be reduced to the value of the happiness produced by it? Incidentally, I do not know whether the author would regard his ethical theory as constituting an argument for immortality, but I should have thought the only sense in which we could say that a potentiality was infinitely superior quantitatively to any of its particular actual manifestations would be if its manifestations were infinite in number. Prof. Montague's survey of ethics in the introduction moves me to special commendation, though I cannot say I am convinced by his particular theory. He has two other articles on ethics, one devoted to a general discussion of the philosophy of Nietzche with its ethico-political implications, and one to setting forth a

law of values of practical importance. The law is that it is far better to have a few cases of great good than very many cases of slight good, and it is likewise very much worse to have a few cases of great evil than a great many cases of slight evil, so that we should adopt opposite tactics according as to whether we are concerned with producing good or diminishing evil, aiming at the achievement of great good by a few combined with security from great misfortunes for all. One of the applications of this principle is to be found in the only political article printed in the book, in which is developed the idea of an economic order including in the same state both communism for those who prefer security and capitalism for those who prefer the chance of wealth, any member of the state being free to choose at any time which order he prefers and join it or leave it with due notice. The scheme would be a vast extension of the experiment which has been to a small extent tried in this country as well as in the U.S.A. of forming partially self-subsistent communities of the normally unemployed who produce for each other since they cannot get an employer to let them produce for the country as a whole, and certainly seems worth serious consideration in some form.

In an article entitled "Beauty is not All" Prof. Montague suggests that artists have confined themselves too much in their aim to the production of beauty, which is "objectified joy", and that they should aim also, though in a subordinate degree, at objectifying the other emotions (pp. 560-563). The various articles which deal with questions on the borderland of physical science or mathematics and philosophy I am not discussing, since I do not possess the technical qualifications required for dealing with them and there is in any case not room available to deal with all the articles. (I tried to induce a colleague with more scientific knowledge than I have to append a note to my review dealing with them, but he found, after reading them, that it would be impossible to do so adequately in the space available.) The articles are entitled: "The Rainbow Series and the Logarithm of Aleph Null", "Beyond Physics", "The Einstein Theory and a Possible Alternative", "A Possible Interpretation of the Quantum", "A Theory of Time Perception", "Time and the Fourth Dimension", "Variation, Heredity and Consciousness", and "Consciousness a Form of Energy". I gather that the opinion of scientists would be likely to be that several of his criticisms had decidedly missed the mark, so that the articles should be read with caution. It remains to call attention to the very interesting and philosophically suggestive autobiographical "Confessions of an Animistic Materialist" (pp. 648-675). I have now at least shown how rich and varied, if not always perfectly digestible, is the fare which Prof. Montague provides.

A. C. EWING.

The Nature of the World: An Essay in Phenomenalist Metaphysics. By W. T. STACE. Princeton University Press. London: Humphrey Milford, 1940. Pp. vi + 262. $3.00.

PROF. STACE thinks that the significant movement in philosophy in recent times has been from idealism through realism to phenomenalism. But he does not see why phenomenalism, which he approves, and is anxious to foster, should be antimetaphysical; and in this book he endeavours to show to what kind of metaphysics it could give rise.

His conclusion may be described briefly as pluralistic personalism.

The only things that actually exist in the universe are cells, and what is not a cell is only an abstraction. The basic constituents of a cell can only be described in terms of two abstracts, consciousness and data; and the word cell is used partly in order to avoid any suggestion that data are in consciousness or in the mind, or that minds are the ultimate constituents of the universe. Cells are not minds and not consciousness: consciousness of data takes place within cells. He does not discuss how the apprehensions of various data are related to the cell in which they occur, but seems to hold that all the data occurring within a single cell fall within the unity of a single experience. At any rate he is clear that a cell is a concrete unity which cannot be divided without being destroyed. That is a second reason for his use of the word cell.

Metaphysics is a search for the real and the real is concrete. Prof. Stace approaches his concrete real by stages, beginning with consciousness of data and proceeding to show what this involves. Consciousness of a datum cannot be analysed into awareness and a datum, since we are unable to find awareness as a datum. But all consciousness of a datum contains (*a*) a recognition of the datum as such-and-such, and (*b*) an interest in the datum, a giving of some valuational colour to it. All we can find in recognition of a datum as such-and-such is an assertion of it as like some other datum or data, past or present; this he describes as the application of a concept to the datum. Valuation he describes as adverbial to conceptual process. Consciousness of a datum is thus seen to involve conceptual process valuationally applied to the datum; which permits him to identify the element of consciousness with this valuational conceptual process. Later he suggests that self-consciousness is implicit in all consciousness of data.

Approaching the situation from another point of view, he identifies consciousness with the universal, data with the particular element in the cell, though, unfortunately, he does not bring his two analyses into relation with one another, so as to show how consciousness of this datum, consciousness of that datum, etc., are related to one another and to the unity of the cell. His discussion seems to imply that it is one and the same valuational process that is to be found in my consciousnes of this red patch and my consciousness of that round shape, and so on; and if this is the case then the cell is a unity through this fact; but I am not sure of this.

Since no datum can exist apart from the consciousness of it, it follows that every datum must be included in some particular cell. It would seem also to follow that no datum can be included in more than one individual cell. For if a datum apart from the consciousness of it is an abstraction, then to say that numerically the same datum can be included in several cells would be to say that numerically the same element can be abstracted from several concretes: but such an element is usually described as general and not particular, whereas for Prof. Stace data are particular. He, however, does not think it logically necessary that every datum should be private to a single cell. If there are public data, this will involve that numerically the same datum can be included in several cells. He seems to hold that this will involve that one cell can apprehend the datum not merely as its own datum but as the datum of another cell; but I do not see why this should be so. He says, *e.g.*, that it may be the case that certain human beings have a direct perception of certain features of God's consciousness. These features will then be data included both in the divine cell and in the human cells: numerically the same data. But

I do not see why a human being who is conscious of such data should attribute them to any cell other than his own. Prof. Stace stresses the view that the time we perceive is our own private time, the space we perceive our own private space, that we cannot have any perception of any non-divine cell other than our own, that we have no perception of any public physical objects, in short that apart from the possible exception of the divine cell we have no experience of anything outside our own cell. I find this exception difficult to understand. The discussion on page 250 seems to me quite unsatisfactory, shifting the emphasis as it does from numerical identity to qualitative similarity of numerically different data in different cells. Even if datum d_1 in cell C_1 is qualitatively similar to datum d_2 in cell C_2 I do not see how this makes possible the direct perception by C_1 of anything as belonging to or falling within C_2.

So much for the direct analysis of our own concrete experience. The details of what we experience can, the author thinks, be most satisfactorily accounted for (in the empirical sense of described) if we adopt certain hypotheses. These hypotheses cannot be proved, they can only be recommended by showing that they lead to no self-contradiction, and that they do account for what we experience more satisfactorily than any alternative hypotheses. They are: (i) that there is nothing real but cells; (ii) that there are many cells, in each of which occurs consciousness of data. We cannot conceive of the possibility of any consciousness different in kind from our own, but we can conceive of the possibility of data different in kind from any experienced by us; (iii) that there is correspondence between the data of various cells.

(i) is recommended by showing the difficulties of any views which can reasonably be attributed to common sense, and of any views put forward by realists.

(ii) is made possible by the author's interpretation of his principle of empiricism in regard to concepts. He holds that that principle allows me to conceive of other consciousness than my own; *e.g.* he rejects the view that the idea of Smith's consciousness is meaningless for me since I cannnot experience Smith's consciousness. It is sufficient for me to have experienced my own.

(iii) is simply the cellular account of the phenomena which are ordinarily expressed by saying that we all live in a common world in which we can make changes by our action. It is sufficiently familiar not to need description here. What is characteristic is the discussion of whether this correspondence needs to be accounted for by referring the changes in the separate cells to a common cause such as God. He argues that this would be the case only if there were an antecedent improbability in intercellular correspondence. And he can see no reason why, in the absence of any data, order should be any less likely than disorder. Probability is relative to data, and in this case we have no data. Thus all types of argument to a common cause or a common designer of the world based on a need to give a reason why the world is orderly or shows features which it would show if it were designed are on his view bound to fail, since they fail to show why a reason is needed. As empiricists we should take the facts as we have them. We can thus assume intercellular correspondence in our hypothesis, and if the facts bear us out we shall have no need to seek for any reason why there should be this correspondence. The cell theory then has no need for God; a plurality of cells is sufficient.

On the basis of (iii) he thinks there is no difficulty in seeing how the various cells, each of which has no direct perception of anything but its

own data, can communicate with each other and even compare one another's data. But he does not go into the question ; it is a matter for the psychologist and not for the metaphysician.

On this view valuation is clearly subjective. Consciousness imputes value to data. Values are either intrinsic or instrumental. Prof. Stace is concerned to show that the subjectivity of all values does not prevent some values from being normative. This he does by means of his conception of welfare. Every cell desires its own welfare ; and to value a datum in a particular way carries with it the belief that this valuation will contribute to the welfare of the cell. What welfare is, he confesses himself unable to define, just as Socrates confessed himself unable to give an account of the good. The cell is bound by the laws of its own nature, and the belief that a particular valuation will contribute to the welfare of the cell may turn out to be mistaken. In so far as cells have the same general characteristics, the same valuations attributing intrinsic value will be found to contribute to, or be inimical to, their welfare, and in so far as this is the case we may say that they ought to value in certain ways. It is in this sense that he speaks of certain values as normative. All this applies to moral and æsthetic values. His theory requires that the normative values of different works of art, as works of art, are to be determined in terms of their importance for human welfare. Truth he does not regard as a normative value at all ; he holds that the only ground we could have for arguing that people ought to acquire knowledge of certain sorts would be that of the instrumental value of that knowledge. The contrast he draws between knowledge and beauty depends, I think, on his concentrating on particular propositions and particular fields of knowledge for his discussion of knowledge, while for his discussion of beauty he is content to deal in generalities.

The last chapter deals with knowledge of God. He argues that it is wrong to reproach a philosopher for making God a *deus ex machina* to solve difficulties otherwise insoluble, for if God is to be reached by way of a philosophical hypothesis, this is the proper and legitimate way of doing it. His own theory of cells he insists has no need of any such *deus*. But he thinks it possible to accept the claim of the religious mystics to have a direct experience of God, so that there is in their case a consciousness of data falling within the divine cell. I have already touched on this conception.

The book is well written and well planned. It contains many interesting discussions of important topics, with much good sense.

L. J. Russell.

Philosophical and Literary Pieces. By Samuel Alexander. Edited, with a Memoir, by his Literary Executor. London : Macmillan & Co., 1939. Pp. viii + 390. 15s.

Alexander died at Manchester on 13th Sept., 1938, in his eightieth year, mercifully spared from the wrath which was so soon to come upon his country and his city. In this book his literary executor, Prof. Laird, has reprinted fourteen of his philosophical and literary pieces ; has prefixed to them a memoir of nearly one hundred pages ; and has supplied occasional notes and a full bibliography of all but the most ephemeral of Alexander's publications. The name of the Editor is an ample guarantee of the thoroughness and conscientiousness of the work.

In the Preface Prof. Laird explains the principles on which, after consultation with Alexander, he chose the pieces to be published. One only

of them, the essay in *The Cornhill* on "The Mind of a Dog", dates back to the period before the first war between England and Germany; the rest belong to the twenties and the early thirties of the present century.

The Memoir gives a very attractive and informative account of an exceptionally lovable and beloved personality. It contains a short fragment of autobiography.

The papers reprinted fall into six classes. First comes a single essay in a class by itself, *viz.* a psychological biography of Alexander's dog "Griff". We learn from the Memoir that the dog's name was derived from the Hegelian "Begriff", and that the essay is unduly flattering to the animal's virtue and intelligence. If McTaggart had written an essay on his cat, I suspect that it would have suffered from the same amiable defect. Next come four literary papers, *viz.* "Dr. Johnson as a Philosopher", "The Art of Jane Austen", "Molière and Life", and "Pascal the Writer". (The last of these contains almost as much about the poetry of Robert Bridges as about the writings of Pascal. It also contains the startling statement that "the word 'Ditcher' is used in German for any imaginative writer".) The next three essays are concerned with æsthetics, a subject to which Alexander devoted much thought in his last years. They are entitled "Art and the Material", "Art and Instinct", and "Artistic Creation and Cosmic Creation". Then follow two papers on value, *viz.* "Naturalism and Value" and "Value". To these succeed two on theological topics, *viz.* "Natural Piety" and "Theism and Pantheism". The last two essays are concerned with Spinoza. One is a lecture in honour of the tercentenary of his birth; the other is the celebrated paper on "Spinoza and Time".

The literary pieces are full of well-chosen quotations, and make very pleasant reading. They must have made even pleasanter hearing when Alexander delivered them as lectures and read the quotations aloud in his beautiful voice. The contributions to æsthetics, value-theory, theology, and Spinozistic lore have all, I think, been published before. I must confess that I find æsthetics so boring, and suspect it to be so largely bogus, that I feel precluded from passing any fair judgments on philosophic writings about it. The remaining essays, except "Spinoza and Time", are rather slight performances. Apart from the lecture in honour of Spinoza's tercentenary, they are on topics which Alexander had treated elaborately in "Space, Time, and Deity". So far as I can see, they add nothing of importance to the corresponding parts of that work, and do little to clear up the difficulties and obscurities with which it abounds. The essay on "Spinoza and Time" is of considerable interest, both to students of Spinoza and to those of Alexander, and it is a great convenience to have it reprinted.

C. D. Broad.

Theory of Probability. By Harold Jeffreys. Oxford: at the Clarendon Press, 1939. Pp. viii + 380. 21s.

In a series of works published since 1919 (the earlier ones in collaboration with Dr. Dorothy Wrinch) Dr. Jeffreys has developed a theory of probability as the measure of degree of reasonable belief on lines fairly similar to those of J. M. Keynes's *Treatise on Probability* (1921). In *Theory of Probability* Jeffreys explains how his probability theory can be applied to the technique of modern statistics; and the greater part of this mathe-

matical treatise is concerned with its application to " estimation problems ", *i.e.* problems of determining the posterior probabilities that the numerical parameters occurring in a particular scientific hypothesis should have particular values or ranges of values, and to the related problem of " significance tests ", *i.e.* that of determining the posterior probability that no values of the suggested parameters will make the hypothesis agree with experience, so that, if this probability is high, a new hypothesis with additional parameters must be thought of and its parameters " estimated ". Jeffreys complains that most contemporary statistical theorists, by rejecting the notion of the prior probability of a hypothesis, have " thereby deprived themselves of any way of saying precisely what they mean when they decide between hypotheses " (p. v); and his aim is to provide principles for such a decision, which principles in practice happen to justify many of the statisticians' rules of thumb (*e.g.* R. A. Fisher's " maximum likelihood " method). The mathematics of this treatise cannot properly be discussed either in this review or by the present reviewer, an amateur in such matters, who must content himself with saying that the powerful mathematical statistical methods which Jeffreys has found of great value in his work on geophysics are clearly an important contribution to statistical technique, whether or not the Jeffreys-Keynes logic of probability is sound.

The fundamental principle of this logic—that " there is a valid primitive idea expressing the degree of confidence that we may reasonably have in a proposition ", to be called " the probability of p on data q " (p. 15)—has previously been expounded by Jeffreys in *Scientific Inference* (1931: reissued with addenda 1937), which was critically noticed by the present reviewer in MIND, N.S., Vol. 40 (1931), pp. 492-496. Besides the epistemological difficulty in the " valid primitive idea ", the great problem which the Jeffreys-Keynes theory has to face is that of giving a criterion for the equality of prior probabilities. Jeffreys uses a principle analogous to Keynes's " Principle of Indifference ", which he states in the form of a definition of equality: " to say that the probabilities are equal is a precise way of saying that we have no ground for choosing between the alternatives " (p. 34). But he applies it in his assignment of prior probability to functional laws by laying down the three principles (to take the place of the " simplicity postulate " of *Scientific Inference*, which " appears insufficiently general "): (1) A law with fewer numerical parameters has a greater prior probability than one with a greater number; (2) If a parameter may have any value in a finite range, or from $-\infty$ to $+\infty$, the prior probability that it lies in equal ranges is equal; (3) If a parameter may have any value from 0 to ∞, the prior probability that its logarithm lies in equal ranges is equal. [(3) is drafted so as to avoid contradictions which would otherwise result: it is not clear that Jeffreys' principles avoid the paradoxes of " geometrical probability " (*e.g.* that of the prior probability that a chord taken at random in a circle is longer than the side of an inscribed equilateral triangle).] These principles go far beyond any mere definition of equal probability: in Jeffreys' logic they must be taken as *a priori*, and as such they seem quite incredible.

But, reading between the lines of Jeffreys' explicit adherence to a probability logic similar to Keynes's, one finds indications of an entirely different view. In treating of prior probabilities Jeffreys frequently uses expressions like " can be taken as " (p. 95), " should be taken as " (p. 96) equal instead of the " must be taken as equal " which his explicit logic requires. And in assigning them we are instructed to ignore " vague and half-forgotten empirical information ": if this is all we have, " the prior

probability used to express previous ignorance should still be used" (p. 337). Moreover, "what the prior probability does, in effect, is to state clearly what question is being asked, more clearly than ordinary language is capable of doing" (p. 338). All these remarks fit in perfectly with the *Spielraum* form of the frequency theory, according to which probabilities are proportions of possibilities in an ideal system of alternatives, and the application of the abstract calculus of these ideal probabilities to the empirical world is analogous to that of a "pure geometry" to the world of physics. [Indeed Jeffreys explicitly proves his multiplication theorem by a *Spielraum* argument (pp. 24-27).] And, although he severely and rightly criticises empirical frequency theories in their usual formulations (von Mises' limiting frequencies and Fisher's "hypothetical infinite populations"), he admits that his objections would lose much of their force if the frequencies were considered in "a large finite population" (p. 306). [He is surely wrong in asserting that the usual frequency theories can give no meaning to probabilities deduced by Bernoulli's and Bayes's theorems: (see, *e.g.*, von Mises, *Probability, Statistics and Truth*, Chap. IV).] In the summary of his principles at the end of the book he makes the significant remark that probabilities interrelated according to his axioms "could be compared with a standard obtained by considering balls in a bag" (p. 350). These dicta, doubtfully consistent with his explicit doctrine, may indicate that Jeffreys is feeling his way towards what would seem to be a more satisfactory theory—that the realm of numerical probability as it is used in the exact sciences is concerned with the application of pure *Spielraum* calculuses to empirically observable frequencies, and that "applied" probabilities are as much empirical concepts as are electrons or zygotes.

R. B. Braithwaite.

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VI.—PHILOSOPHICAL PERIODICALS.

PHILOSOPHY OF SCIENCE, vii. 3 (July, 1940). **W. M. Malisoff.** *What is Freedom?* ["Freedom is variability within a system of interaction. . . . All I require of a system in which the concept of freedom can arise is that it consist of observing and observed parts and that these parts, observing and observed, could be partitioned in more than one way to ensure some variability."] **W. F. G. Swann.** *The Significance of Scientific Theories.* [A paper read to the International Congress for the Unity of Science, Harvard, September, 1939. Argues, not very convincingly, that the use of "models" in scientific theories can be replaced by the exercise of intuitions arising from the specific characteristics of widely applicable mathematical methods. "The time is ripe . . . to sharpen intuition with regard to them (mathematical functions and operations) so that what was formerly a kind of tussle between forces and inertia in a dynamical equation, now becomes a war between terms of different characteristics."] **H. Hart.** *Operationism Analysed Operationally.* [Detailed criticism of the operationalist view of psychology advocated by S. S. Stevens in recent papers. Hart refuses to identify operationalism with behaviourism, and attacks the distinction between the formal and material modes (Carnap) as "metaphysical dualism". In a series of interrelated definitions he attempts to provide the basis for an "undogmatic operationism" by providing phenomenalistic analysis of such terms as "operation", "observation", "myself", "experience-patterns", "memory images", etc.] **R. S. Lillie.** *Biological Causation.* [Discursive speculations, almost impossible to summarise. A specimen quotation will illustrate the level at which the discussion is conducted: "So far as we can judge from our own experience, a correlating or unifying action which imposes a synthetic unity . . . upon otherwise unorganised data, seems always to have in it (initially at least) something of the mental or psychic. . . . Such action differs from that found in a purely external or physical world; some factor is present over and above the physical . . . which we may call a synthetic (or creative) factor; this is directive and individualising in its action; apparently it opposes or counteracts the general thermodynamic trend towards uniformity."] **W. V. Metcalf.** *The Reality of the Unobservable.* [Scientific method is concerned with "the simplest and clearest self-consistent explanation of our experiences" (*i.e.* "sense-impressions"). "The principle of the meaninglessness of the unobservable is both physically and philosophically untenable."] **E. O. Sisson.** *Relation in Reality and Symbolism.* [Based on the author's distinctions between the *obverse* and *reverse* of a symbol. The "outer, public, part, the sound or mark" is the obverse; the "inner or private part, the 'meaning' or 'idea'" is the reverse. That which the symbol denotes or refers to is called "pragma". This terminology is used in making a number of not altogether lucid remarks on the status of relations.] **D. D. Lee.** *A Primitive System of Values.* [An analysis of the logical and

ethical implications of the Trobriand Islanders. Lee's conclusions are based on a close study of Malinowski's work. "We find in Trobriand ethics, applied in activity, the logical concepts which are implicit in the Trobriand language. We find that causes and consequences play no part in evaluation. We find that an act or an object is an end, and a reason, unto itself; and that the standard of its evaluation lies within it. We find that telic motivation is of no social value, but that supreme value lies in the act which is utterly futile and disparate, enclosing within itself its own beginning and its own end."] **M. Goran.** *The Literati Revolt Against Science.* ["For compared to the attacks upon it, science has scarcely fired a defensive blow. Unperturbed, it has not ceased investigations; undaunted, it has refused to compromise. It answers with continued studies of nature."] Reviews.

PROCEEDINGS OF THE ARISTOTELIAN SOCIETY. N.S.: Vol. xl, 1939-40. **Sir W. D. Ross.** The Presidential Address: 'Some Thoughts on Aristotle's Logic'. [The main points of the address are as follows. A's interest in logical enquiries was at first mainly practical, but later became predominantly theoretical. If his syllogistic theory owed anything to Platonic suggestion, a passage in the *Phaedo* (104*e*) is the most likely source. For establishing the validity or invalidity of particular moods, A appeals sometimes to general considerations and formal methods, but sometimes, and especially as regards invalidity, to particular instances in which the invalidity is obvious. Finally, the importance attached by A to Fig. 1 and to syllogism in general is explained.] **S. Hampshire.** 'Ideas, Propositions and Signs.' [The paper is an attack (in which the writer regards himself as in line with Berkeley's attack on abstract ideas) on philosophical theories which interpose between words and the relevant concrete experiences to which the words refer, "intermediaries, whether these be called 'universals', 'concepts', 'objectives', or 'propositions' and the 'elements of propositions'". "To understand a sentence which expresses an empirical proposition is to be able to imagine and to recognise situations to which the sentence can properly be used to refer." 'Propositions', interpolated between sentences and experiences, have "played a part in recent philosophy very similar to that played by abstract ideas in Berkeley's time".] **C. E. M. Joad.** 'Appeal to Philosophers.' [Joad thinks that the present age resembles in a number of important respects that of Plato and Aristotle; it is an age of transition, of political unsettlement, of religious and moral decline. It therefore makes the same demand for a serious and constructive philosophy which Socrates, Plato, and Aristotle sought to satisfy in their age. Our present-day philosophy for the most part fails lamentably even to attempt to meet the demand. "Preoccupation with the correct analysis of the meaning of sentences seems to me to be a form of intellectual fiddling while Rome burns."] **C. A. Campbell.** 'The Psychology of Effort of Will.' [After some preliminary remarks, Campbell first criticises certain attempts (McDougall, Stout, Thouless) to explain the experience of effort of will which would make it unnecessary to invoke a unique and irreducible psychical energy; and, secondly, endeavours to give a positive account of the experience which will bring out the view of it which (after James) he wishes to advocate. The paper is clear, and as well argued perhaps as the case permits, but it is unlikely to convince an opponent either in its criticism or in its positive account. Campbell thinks that most psychologists are influenced in dealing with the subject

by scientific or philosophical prejudices, *e.g.* they refuse to distinguish between the self and its character, whereas he would claim for the agent a freedom even from the character as so far formed. "We cannot, surely, regard our formed character as determining a decision as to whether or not we shall *combat* our formed character!" True, but what then does determine the decision? To answer 'the self' or 'the capacity, through effort of will, to cut loose from the formed character' is to put us off with empty phrases.] **H. B. Acton.** 'The Philosophy of History.' [After a brief consideration of religious and metaphysical philosophies of history on the one hand, and sociological theories on the other, Acton goes on to discuss the rather different topic of the objectivity of historical writing. On what principles is the historian to select his facts and measure their importance? The measure cannot be wholly objective. "'Importance' is not to be analysed solely in terms of the extent of the effects, but requires also to be understood in terms of some standard of value," but this need not imply any distorting bias in the historian.] **C. H. Whiteley.** 'The Causal Theory of Perception.' [Taking for granted an absolute distinction between sense-data and the physical object, the writer sees himself in an apparent dilemma between solipsism on the one hand and the assertion of an innate idea of the object on the other. He tries to find a way out by maintaining that sensation is not primarily a mode of cognition, but "is a process in which I am being affected; and that means that something other than me is affecting me". On this basis he seeks to give what is apparently meant as a psychological account of the way in which we come by the idea of the physical object. He does not seem to realise at all that his problem is wholly artificial. Ordinary experience (even in the philosopher) knows nothing of an absolute distinction between 'sense-data' and the physical object.] **W. Kneale.** 'The Notion of a Substance.' [After an introductory section in which he notices the views of various philosophers from Aristotle to Russell, Kneale examines what is meant by saying that substances are simple, or again that they are the subjects of atomic propositions. Following a linguistic clue derived from Russell, he distinguishes things as being of higher or lower levels according as statements about the one kind of thing can, or cannot, be replaced by statements about the other kind (*e.g.* States and men), and then proposes to define substances as things of the lowest level. He then argues that Russell's view that events are substances is untenable, and finally discusses the various views according to which it would be denied that there are substances in the sense above defined. Kneale's own conclusion is as follows: he sees no valid reason to reject the view that there are substances in a strict sense of the term, and he believes that substances must be continuants, but he cannot confidently cite examples, though he thinks that minds have the best claim.] **A. Lion.** 'Sovereignty.' [This paper is lengthy, somewhat pretentious in manner, and often obscure, and the writer does not, after all, seem to have very much to say. We are told at the outset that "it is assumed here as a self-evident proposition that the very existence of the State requires *to-day*, in order that its sovereign rights should be positive, the correlative existence of an *organised* international community". The conclusion eventually arrived at does not seem to differ greatly from what was assumed as self-evident.] **G. Katkov.** 'The Pleasant and the Beautiful.' [For two reasons this paper makes rather difficult reading. First, Katkov surprises us by announcing that he intends to "omit any reference to art"; as we might expect, the discussion is consequently very abstract. Second, he works, as is natural, on the lines of Brentano's

psychology, and the technicalities of this psychology are not very familiar here. In the first section he may be said to be distinguishing between sensory pleasures and pains (*e.g.* pain-sensations), on the one hand, and their pleasantness or unpleasantness on the other. Next, if the beautiful falls within the pleasant, we must at any rate recognise that the object is perceptual rather than sensory, but also, on the other hand, that the pleasure does not depend on the truth of the perception or the real existence of the object. The object might be merely imagined. The term 'representation' is used to signify our 'intentional' relation to the object. "Whenever such an intention is the object of an underived liking, we call the object of the representation beautiful." A further point of distinction of æsthetic from sensory pleasure is that a higher state of the former is not, as a higher state of the latter is, a mere matter of intensity; it is rather a preference. The concluding section discusses the question of the objectivity or subjectivity of æsthetic liking and preference.] **A. C. Ewing.** 'The Linguistic Theory of *a priori* Propositions.' [A long and somewhat diffuse paper, which would probably have gained considerably in point and effectiveness by being made shorter. It criticises the linguistic or verbal theory (1) of *a priori* propositions, (2) of deductive reasoning. The former fails to explain why we attribute necessity to the propositions, and how we come to know them. The latter seems to imply more or less directly that we cannot know the premises without knowing the conclusion. The linguistic theories may have been accepted partly because they seem to account in a simple way for the self-contradiction involved in the denial of *a priori* propositions and deductive conclusions, partly under the influence of recent views about the arbitrariness of postulates in mathematics; but closer scrutiny reveals the difficulties involved.] **A. H. Hannay.** 'Religion, Morality, and Philosophy.' [A convenient summary of the paper is given, but it is too long to quote. The following indication of the line of argument must suffice. Morality may exist without religion, but not in its highest form without the principles and outlook which religion and philosophy provide. New moral problems, such as those now confronting us in the international sphere, can be solved only when goodwill and sound thinking are exerted equally in the task.]

Revue Néo-Scolastique de Philosophie. Tome 42. (Deuxième série, No. 63.) Août, 1939. **J. Maréchal.** *L'aspect dynamique de la méthode transcendentale chez Kant.* [There is a certain duality of purpose which infests the *K. d. r. V.* Is it a critical *propœdeutic* to metaphysics or does it actually contain the fundamental principles of a true metaphysic? If it is the first, its method should be strictly regressive and "analytic"; if the second, it should proceed by "synthesis". Is the problem to be solved that of the possibility of *experience* or that of the possibility of *objective thought?* The first answer is that contemplated in the *Introduction*, the second that of the "transcendental deduction". What Kant should prove, but never does prove, is that the field of experience and that of objectively valid knowledge coincide. On what does the objectivity of the object of knowledge depend, on the relation of the content of consciousness to the formal unity of consciousness, or on the origin of that content in "intuition"? Both views find expression in the *K. d. r. V.* But in ed. B. Kant has passed from the conception of the *subsumption* of phenomena under general *a priori* conditions to that of a *synthesis* of them by the activity of apperception through the categories. "Henceforth the type

of the object is dynamic rather than static, and the objective synthesis of the given takes on the character of a *becoming* in the immanent object." Thus *motion* had been at first treated as a purely empirical notion, but by the time when Kant wrote the *Metaphysical Principles of Natural Science*, motion, as "the description of a space", had come to be claimed as an *a priori* concept belonging "not merely to geometry but to transcendental philosophy", no less than the "*pure* forms of intuition" and the categories. Kant is steadily feeling his way towards an idealist version of the *innéisme* of Leibniz, a tendency which reveals itself prominently in the *Critique of Judgement*, and still more markedly in the so-called *Opus postumum*. It is this line of thought in Kant which leads logically beyond him to Fichte and Hegel.] **A. Hayen.** *Intentionalité de l'être et Métaphysique de la participation.* [The concept of *intentionality* is central in the Thomist philosophy; by the intentionality of a being is meant "the presence in it of a force or perfection which transcends it and carries it beyond itself". And by "presence" in this formula is meant a real but imperfect identity between the being and the perfection spoken of, or, more briefly, intentionality = participation = tendency. In the "realistic" philosophy of St. Thomas the objectivity of our knowledge is explained by a double "intentional presence", that of an intelligible object, acting through the intermediation of the senses, to an intelligent subject, and that of the subject, reacting through the same intermediaries, to the object, which it thus makes "intelligible in *act*". Behind both lies the "intentional presence" of God to the world of creatures, which is constitutive of object and subject alike. The purpose of the article, which is perhaps too condensed to be everywhere easy to follow, is not to *prove* the theses of the "relative transcendence of the external world and the absolute transcendence of God", but simply to establish the internal coherence of the theses in the face of possible criticisms.] **D. A. Callus.** *Two early Oxford Masters in the Problem of the Plurality of Forms. Adam of Buckfield—Richard Rufus of Cornwall.* [A study, with the production of the requisite texts, relative to the still imperfectly known early history of the theory of "plurality of substantial forms", as illustrated by the arguments of Adam of Buckfield, who supported it, and Richard Rufus, the first known Oxford commentator on the *de Anima*, who denied it.] **J. Leclercq.** *Comment comprendre la sociologie? À propos d'un livre récent.* [The "recent work" is Q. Guarvitch, *Essais de Sociologie*. G. is a sociologist of the French school dominated by the influence of Durkheim and Lévy-Bruhl, and the object of the article is to contend very effectively that Durkheim from the outset vitiated the scientific study of social facts and tendencies by the introduction of arbitrary metaphysical and moral preconceptions. Hence, it is argued, the relative inferiority of French as compared with British and especially American contributions to sociology.] **F. van Steenberghen.** *Travaux récents sur la pensée du XIII^e siècle.* **J. Paulas.** *Monographies récentes sur les philosophies des XIV^e-XVI^e siècles.* Book notices, Chroniques, *Répertoire Bibliographique* (separately issued).

VII.—NOTES.

NOTE ON THE DEVELOPMENT OF KANT'S THOUGHT IN THE CRITIQUE OF PURE REASON.

THE "layer theory" applied to Kant's works may take a severer or a milder form. It might mean (1) that the *Critique of Pure Reason* is a patchwork made up by the "scissors and paste" method from MSS. of various dates. In that case it would be possible to pick out parts that represent pre-critical stages in Kant's development and others that represent the critical stage or stages. Or it might mean (2) no more than that Kant's writing at any period represents "complex unstable thought-positions" to borrow Mr. Gibson's phrase about Locke. Old habits of thought may have reasserted themselves from time to time in spite of having been rejected in principle. In that case it would be impossible from internal evidence to decide on the period or the stage in his thinking to which any particular passage belongs. The purpose of this note is to give a trivial instance from passages which can be dated in support of (2) as the more likely view.

It can hardly be doubted that the alterations made in the 2nd Edition are the fruit of changes in Kant's views between 1781 and 1787. It seems highly probable that the Preface to the 2nd Edition was the last thing he wrote, in accordance with the normal habits of authors. There is the additional evidence here that the saying that "reason has insight only into that which it produces after a plan of its own" is found in this Preface and again at the beginning of the *Critique of Judgment*, while there seems to be nothing quite comparable elsewhere in the *Critique of Pure Reason*.

In the 1st Edition the *First Analogy of Experience* is stated in the form, "All appearances contain the permanent (substance) as the object itself and the transitory as its mere determination, that is as the way in which the object exists". In the 2nd Edition this is changed to "In all changes of appearances substance is permanent; its quantum in nature is neither increased nor diminished". The "Proof" which follows does not seem to contain anything to justify the change from a vague but safe formula to one more precise but much more questionable. However, in the interval between the two statements, in 1782, Lavoisier had published the work in which he made the Law of Conservation of Mass one of the first principles of chemistry. This was the first Conservation Principle to attain real importance in physical science—the Conservation of Momentum, the only other one then known, applies strictly only to "ideal systems". Kant apparently jumped at this new development as supplying the very notion he was looking for, regardless of the fact that it is hardly an *a priori* principle and should be treated rather as an approximate rule useful for experimental purposes, *e.g.* to make quantitative chemical analysis possible. It would appear that most of Lavoisier's experiments were done before 1777, and Kant might have heard of the work before the belated publication

in 1782. Mr. Whitehead has indicated an instance of Kant's keen interest in contemporary scientific work in France (*Science and the Modern World*, p. 199 footnote). But unless Kant was in very close touch with Paris through friends or correspondents he would hardly have realised the significance of Lavoisier's new conceptions until he had a chance of reading the actual Memoir published by the Academy.

While Lavoisier established the Conservation of Mass, he also fully and finally established oxygen as the essential factor in combustion and demolished the *phlogiston* theory sponsored by Stahl. Phlogiston was the hypothetical substance which escaped from anything when burning and also from a metal when it was converted to *calx* (metallic oxide). Stahl's main contribution seems to have been to link up metallic oxidation with ordinary combustion. It was soon found that loss of phlogiston entailed gain of weight. In spite of the difficulty of reconciling a substance of negative weight with the Newtonian Law of Gravitation, the phlogiston theory prevailed until the 1780's. It is remarkable then, that in the Preface to the 2nd edition, where Kant speaks of the revolution in the physical sciences, whereby "reason has insight into that which it produces after a plan of its own", after quoting two examples from physics, he gives as his third, "when Stahl changed metal into calx and calx back into metal *by withdrawing something and then restoring it*". ("Als . . . Stahl Metalle in Kalk und diesen wiederum in Metall verwandelte, *indem er ihnen etwas entzog und wiedergab.*" "Kalk" is commonly mistranslated "lime". Stahl, of course, lacked the technical means for reducing lime.) The words in italics imply the phlogiston theory, on which Kant must have been brought up. Lavoisier's work so impressed Kant as to induce him to make alterations of doubtful value in his text, yet later the old pre-Lavoisier habit of thought reasserted itself.

It might perhaps be urged that there is merely a slip of the pen here; that Kant intended to put the matter in the reverse order to fit the new theory and say "calx into metal and then metal back into calx". This is unlikely because he could hardly have spoken of oxygen, the grand discovery of the day, as "etwas", any more than a writer of recent times could so refer to radium. Phlogiston, on the other hand, could not properly be called anything else.

A. D. RITCHIE.

DEATH OF PROFESSOR G. DAWES HICKS.

We regret to announce the death, on 16th February, of Prof. George Dawes Hicks. An Obituary Notice will appear in the next number of MIND.